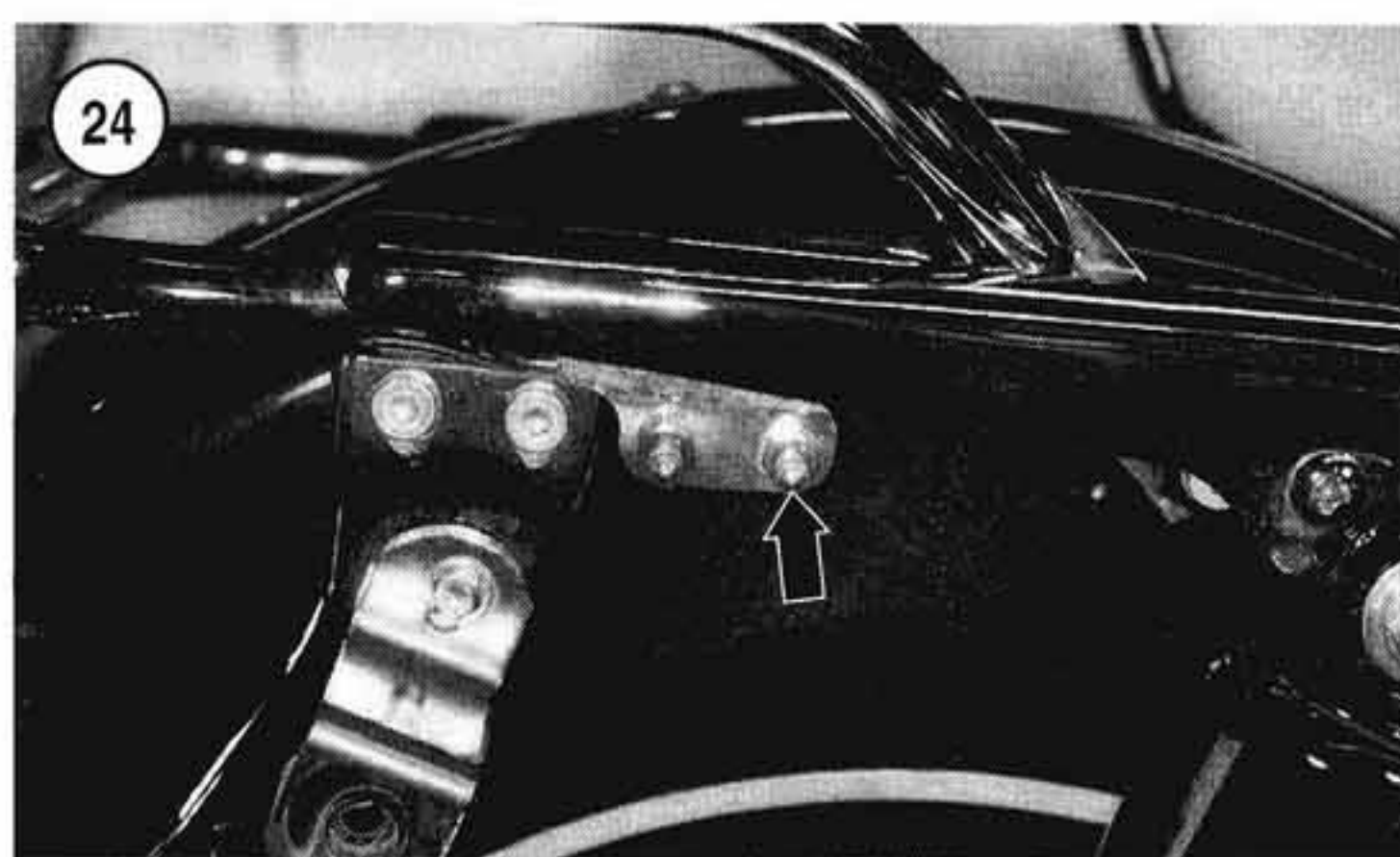
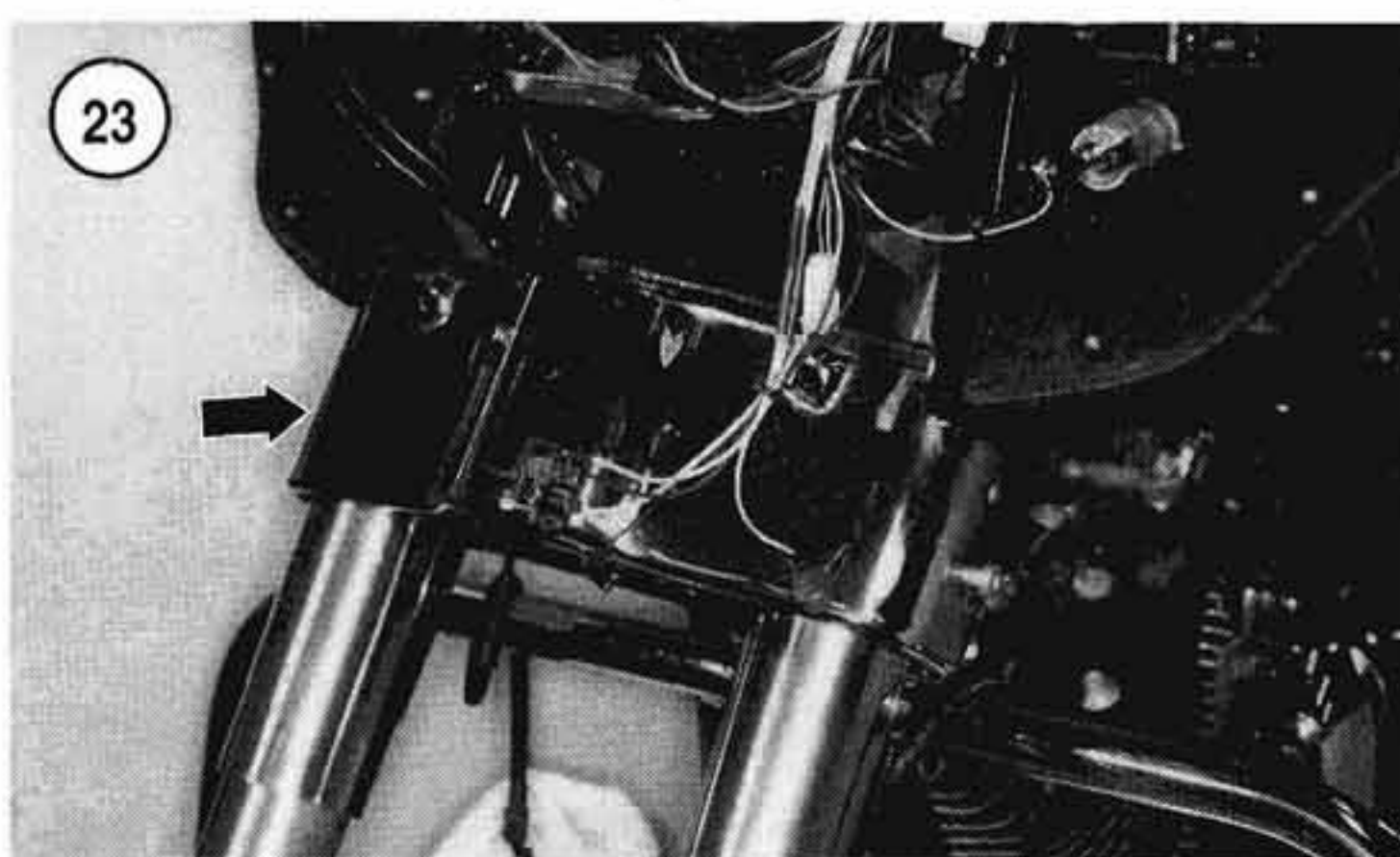
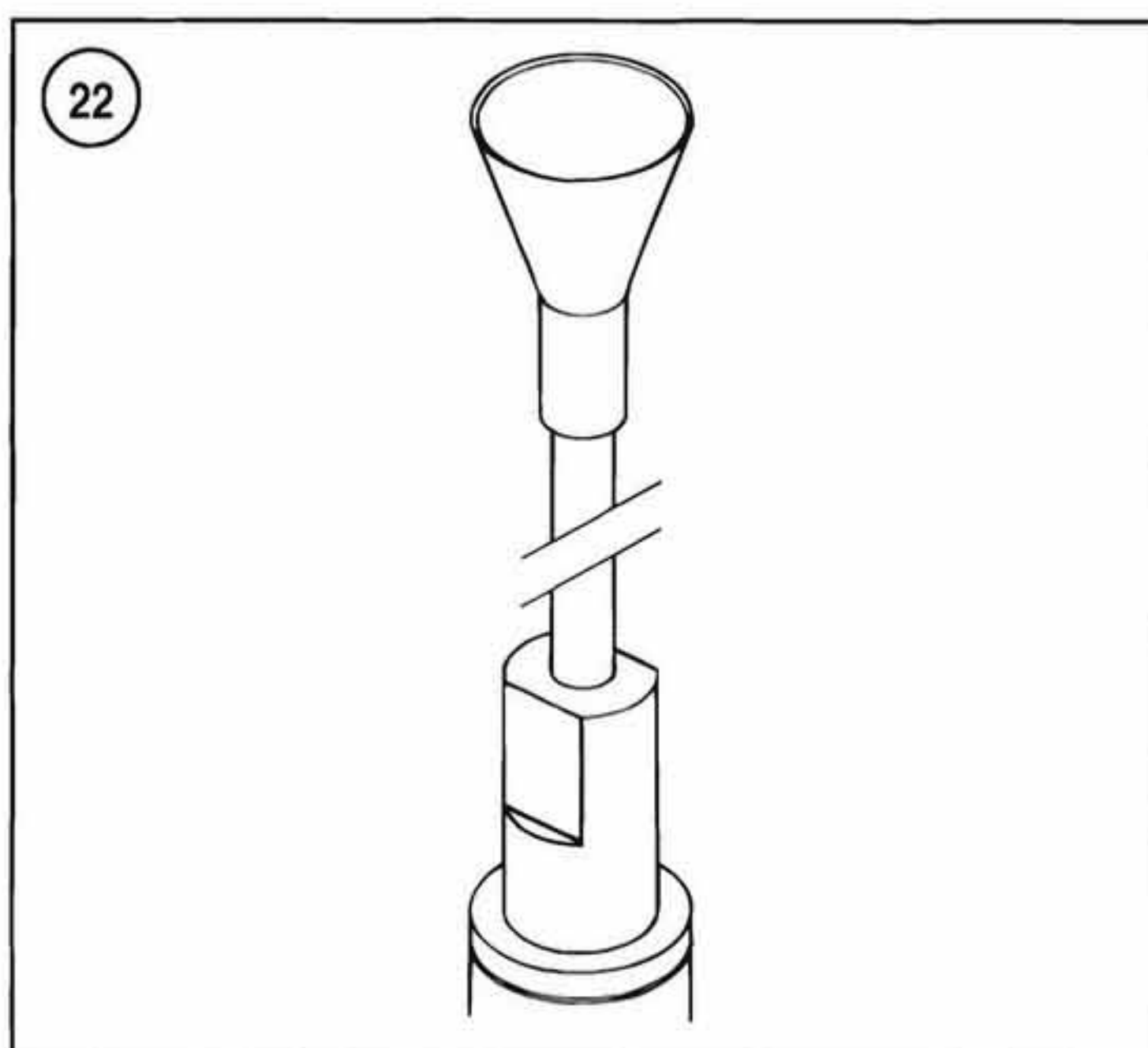




17. If necessary on FXWG models, insert a clear plastic tube into the fork cap bolt opening (**Figure 22**). Attach a funnel to the plastic tube and refill each fork leg with the correct viscosity and quantity of fork oil in **Table 1**. Remove the small funnel and plastic tube. Install the cap, washer and oil seal.

### FRONT FORK (FLH AND FLT SERIES MODELS)

Before assuming a fork is malfunctioning, drain the front fork oil and refill with the proper type and quantity fork oil as described in Chapter Three. If there is still a problem, such as poor damping, a tendency to bottom or top out, or leaks around the oil seals, follow the service procedures in this section.

To simplify fork service and to prevent the mixing of parts, remove, service and install the fork legs individually.

#### Removal (Fork Not To Be Serviced)

1A. On all FLHT series models, remove the outer fairing. On FLHTC series models, also remove the storage box. Refer to Chapter Fifteen.

1B. On all FLHR series models, remove the headlight nacelle as described in Chapter Nine.

2. Remove the passing lamp assembly as described in Chapter Nine.

3. Support the motorcycle with the front wheel off the ground. Refer to *Motorcycle Stands* in Chapter Ten.

4. Remove the front fender and front wheel as described in Chapter Nine.

5. Remove the screws securing the chrome mounting bracket (**Figure 23**) and remove the bracket.

6. If both fork tube assemblies are going to be removed, mark them with an *R* (right side) and *L* (left side) so the assemblies will be reinstalled on the correct sides.

7. On models so equipped, remove the right saddlebag as described in Chapter Fifteen.

#### WARNING

*Use caution when releasing the air from the front fork air valve. Moisture and fork oil may spurt out when the air pressure is released. Protect eyes accordingly.*

8. Cover the rear brake assembly and wheel prior to releasing the compressed air from the rear air valve. If necessary, wipe any oil residue that may have been ejected from the air valve.

9. Remove the cap from the front fork air valve (**Figure 24**). Then slowly depress the air valve to evacuate the air from the front fork air pipe system. Unscrew and remove the core from the air valve. Place the air valve core and cap in a reclosable plastic bag to avoid misplacing them.

10. Refer to **Figure 25**. Unscrew and remove the hex bolts (**Figure 26**) securing the banjo bolt on top of each fork tube. Move the air tube assembly out of the way from the fork assemblies.

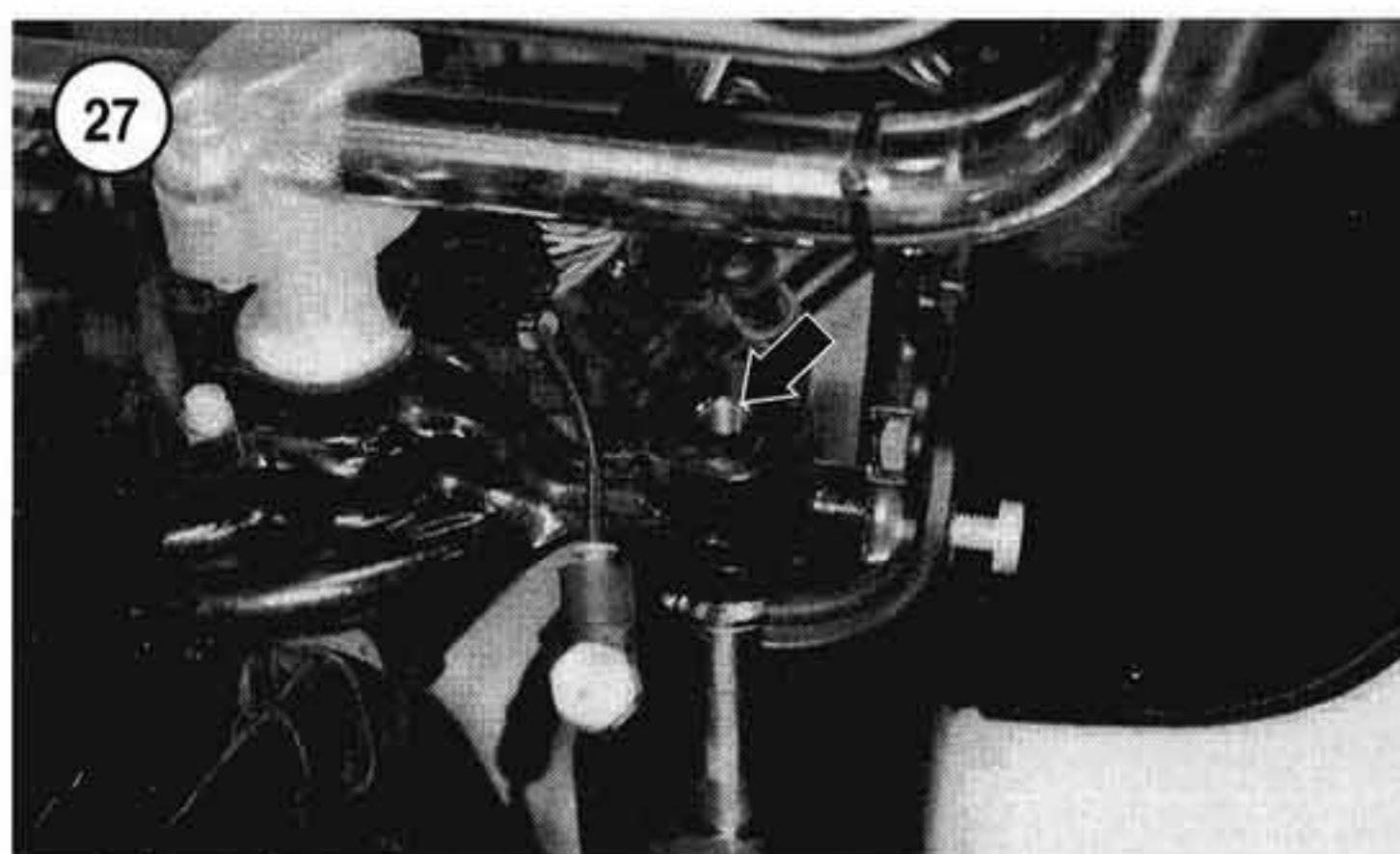
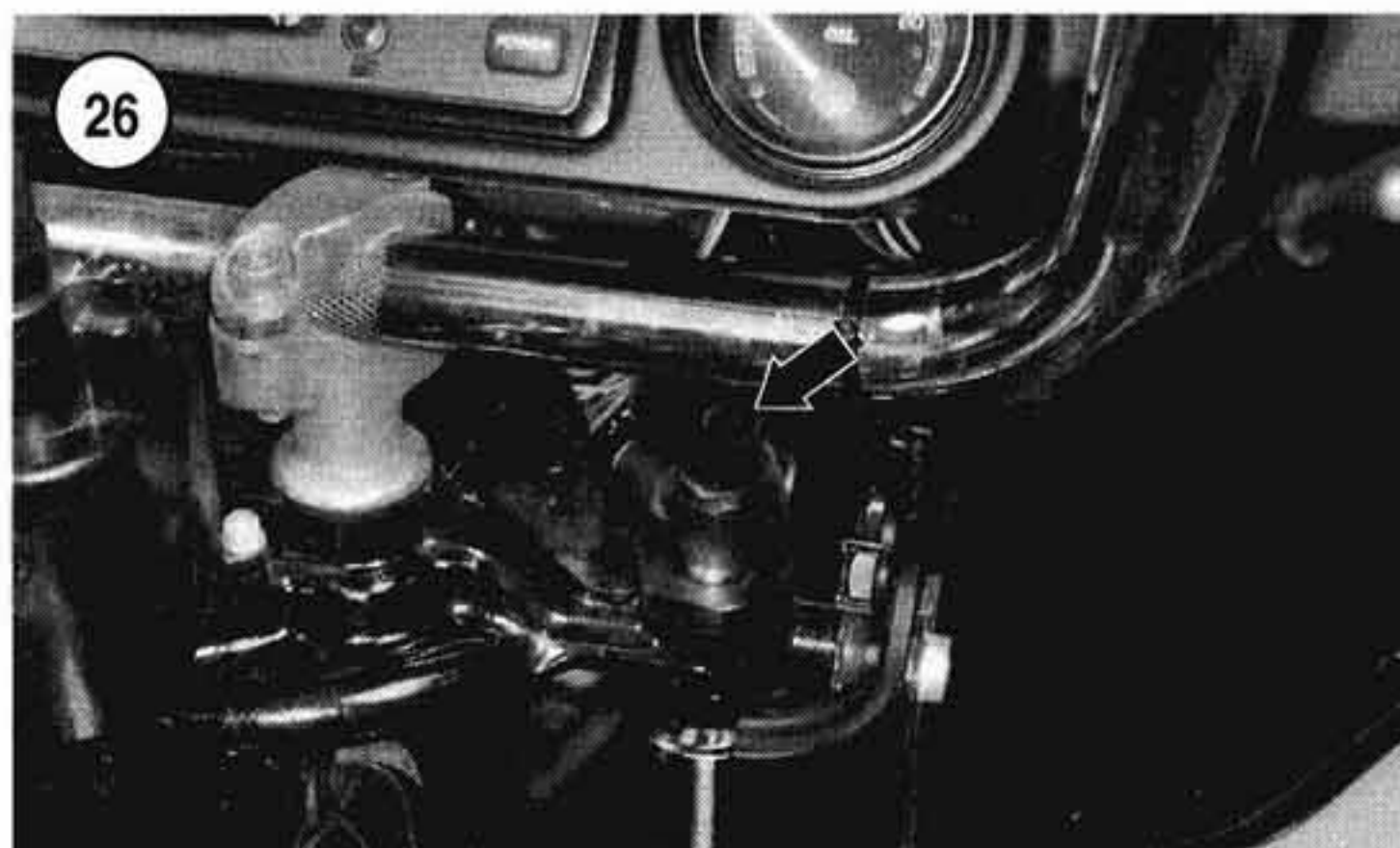
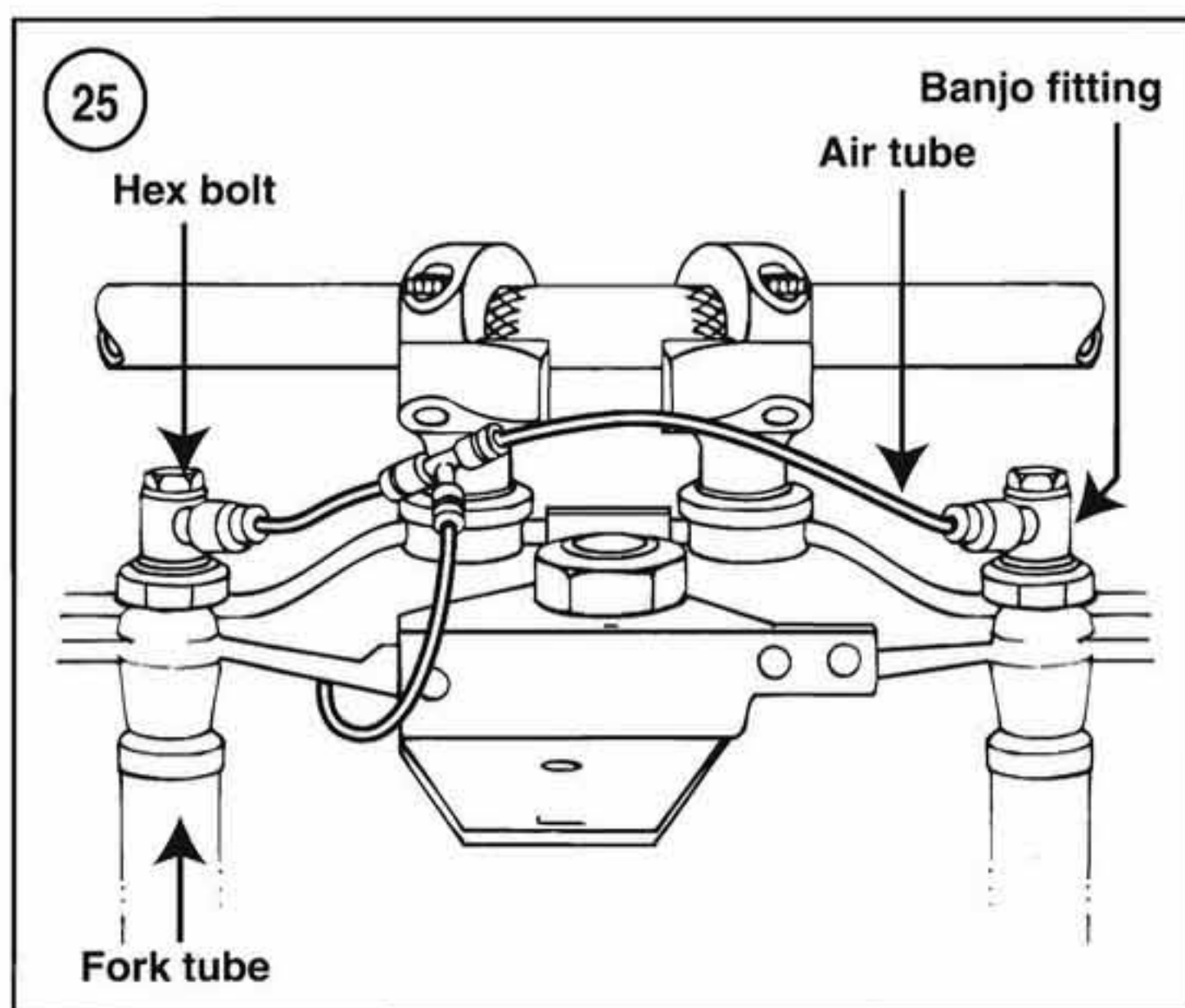
11. Remove the fork cap bolt (**Figure 27**) from the top of the fork tube.
12. Working at the base of the steering stem, loosen the pinch bolt (**Figure 28**).
13. Slide the fork tube out of the upper fork bracket. Remove the rubber stop (**Figure 29**) from the fork tube.
14. Continue to slide the fork tube out of the lower fork bracket. It may be necessary to rotate the fork tube slightly while pulling it down and out. Remove the fork assembly and take it to the workbench for service. If the fork is not going to be serviced, wrap it in a bath towel or blanket to protect the surface from damage.
15. Repeat for the other fork assembly.

### Installation (Fork Was Not Serviced)

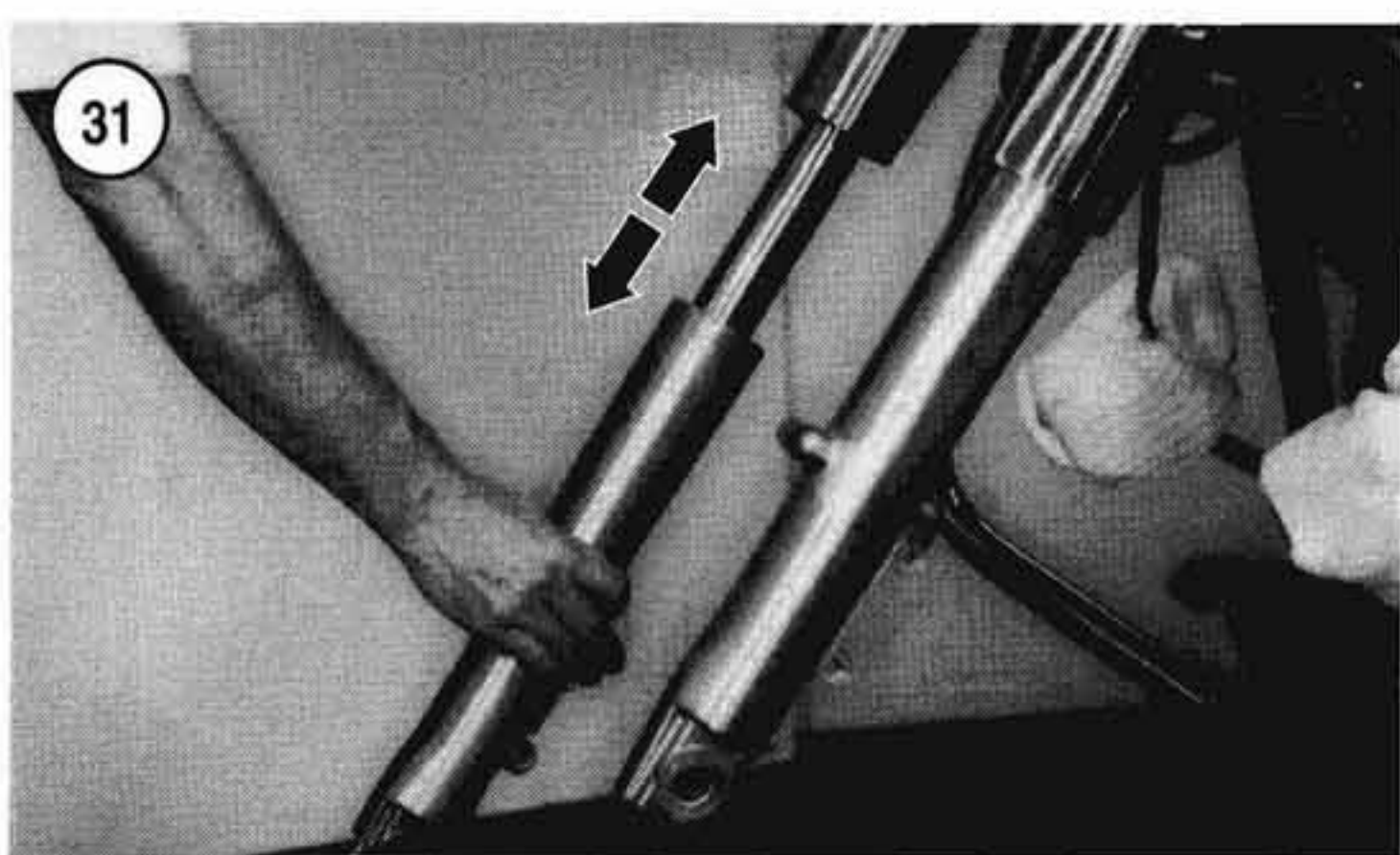
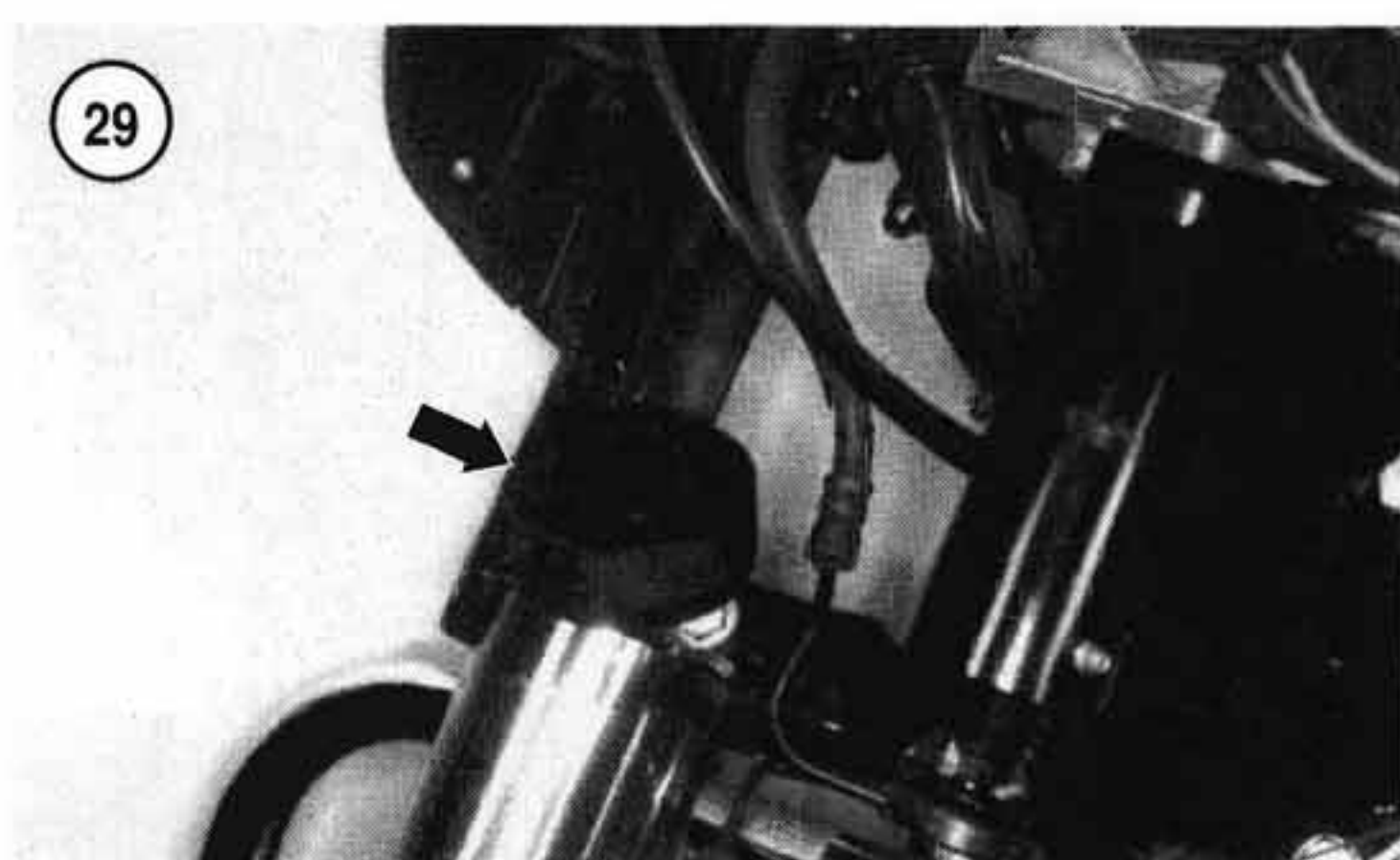
1. Install a fork tube through the lower fork bracket and install the rubber fork stop (**Figure 29**).
2. Continue to push the fork tube up through the top fork bracket until it bottoms against the upper fork bracket.
3. Tighten the pinch bolt (**Figure 28**) to 40 ft.-lb. (54 N•m).
4. Install the fork cap bolt (**Figure 27**) onto the top of the fork tube and tighten securely.
5. Install a *new* O-ring onto each hex bolt (**Figure 30**) and apply a light coat of clean engine oil to them.
6. Install the air tube assembly onto the top of the fork assemblies and install the hex bolts through the banjo bolts. Tighten the hex bolts to 97-142 in.-lb. (11-16 N•m).
7. On models so equipped, install the right saddlebag as described in Chapter Fifteen.
8. Install the front fender and front wheel as described in Chapter Nine.
- 9A. On all FLHT series models, install the outer fairing. On FLHTC series models, also install the storage box. Refer to Chapter Fifteen.
- 9B. On all FLHR series models, install the headlight nacelle as described in Chapter Nine.
10. Apply the front brake and pump the front fork several times to seat the fork tubes and front wheel.
11. Adjust the front fork air pressure as described in this chapter.

### Removal (Fork To Be Serviced)

- 1A. On all FLHT models, remove the outer fairing. On FLHTC models, also remove the storage box. Refer to Chapter Fifteen.
- 1B. On all FLHR models, remove the headlight nacelle as described in Chapter Nine.



2. Remove the passing lamp assembly as described in Chapter Nine.
3. Support the motorcycle with the front wheel off the ground. Refer to *Motorcycle Stands* in Chapter Ten.
4. Remove the front fender and front wheel.
5. Remove the screws securing the chrome mounting bracket (**Figure 23**) and remove the bracket.



6. If both fork tube assemblies are going to be removed, mark them with an *R* (right side) and *L* (left side) so the assemblies will be reinstalled on the correct side.

7. On models so equipped, remove the right saddlebag as described in Chapter Fifteen.

#### WARNING

*Use caution when releasing the air from the front fork air valve. Moisture and fork oil may spurt out when the air pressure is released. Protect eyes accordingly.*

8. Cover the rear brake assembly and wheel prior to releasing the compressed air from the rear air valve. If necessary, wipe any oil residue that might have been ejected from the air valve.

9. Remove the cap from the front fork air valve (**Figure 24**). Then slowly depress the air valve to evacuate the air from the front fork air pipe system. Unscrew and remove the core from the air valve. Place the air valve core and cap in a reclosable plastic bag to avoid misplacing them.

10. Refer to **Figure 25**. Unscrew and remove the hex bolts (**Figure 26**) securing the banjo bolt on top of each fork tube. Move the air tube assembly out of the way from the fork assemblies.

11. Remove the fork cap bolt (**Figure 27**) from the top of the fork tube.

12. Loosen the pinch bolt (**Figure 28**) at the base of the steering stem.

13. Slide the fork assembly part way down and retighten the pinch bolt (**Figure 28**).

14. Place a drain pan under the fork slider to catch the fork oil.

15. Use an 8 mm Allen wrench and impact driver and loosen the damper rod cartridge 8 mm Allen bolt at the base of the slider.

16. Remove the Allen bolt and drain the fork oil. Pump the slider several times to expel most of the fork oil. Reinstall the Allen bolt to keep residual oil in the fork.

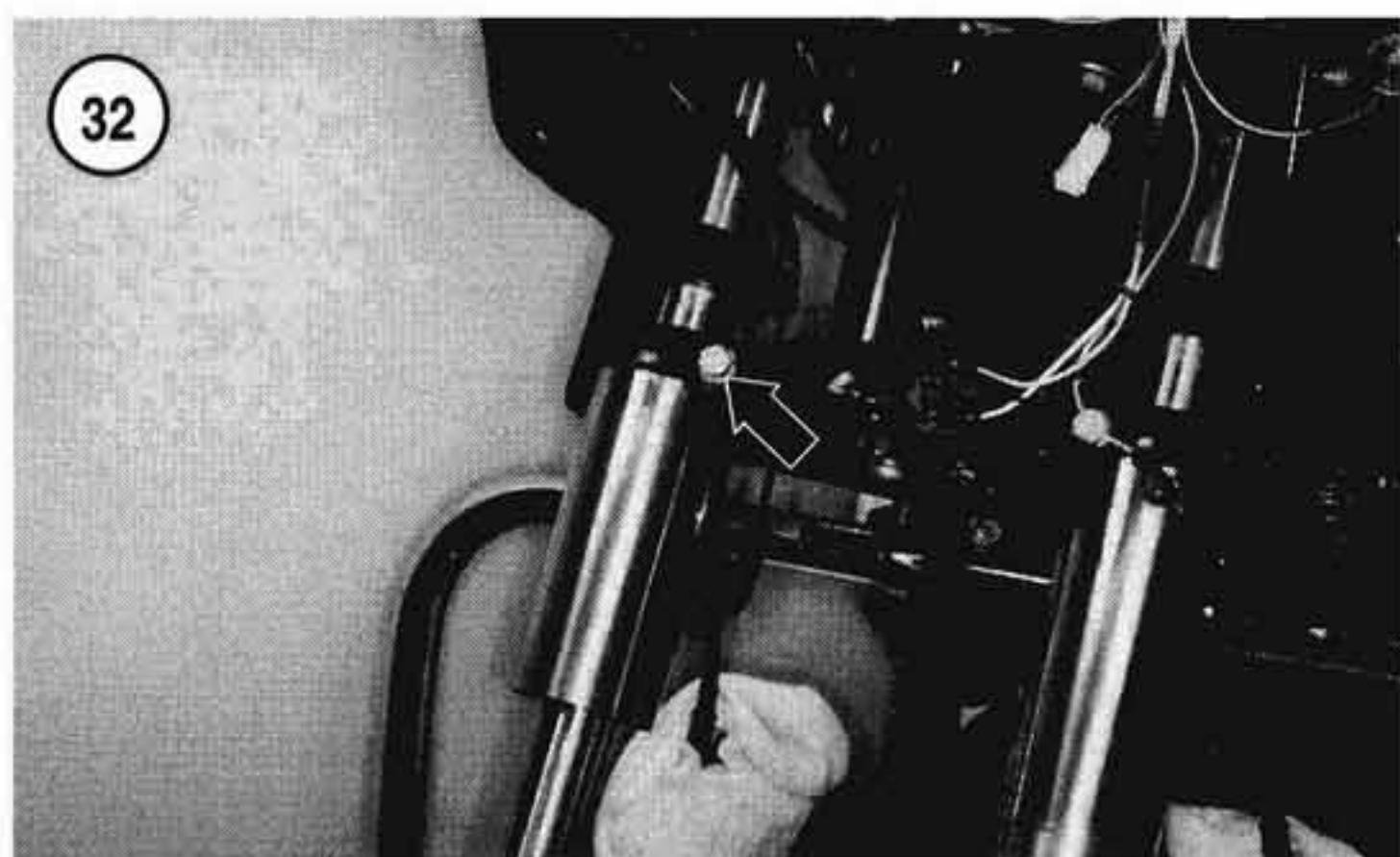
17. Remove the stopper ring from the fork slider.

18. Lower the fork slider on the fork tube.

#### NOTE

*It might be necessary to slightly heat the area on the slider around the oil seal prior to removal. Use a rag soaked in hot water; do not directly apply a flame to the fork slider.*

19. There is an interference fit between the bushing in the fork slider and the bushing on the fork tube. In order to remove the fork tube from the slider, pull hard on the fork tube using quick in-and-out strokes (**Figure 31**). Doing so will withdraw the bushing and the oil seal from the slider.



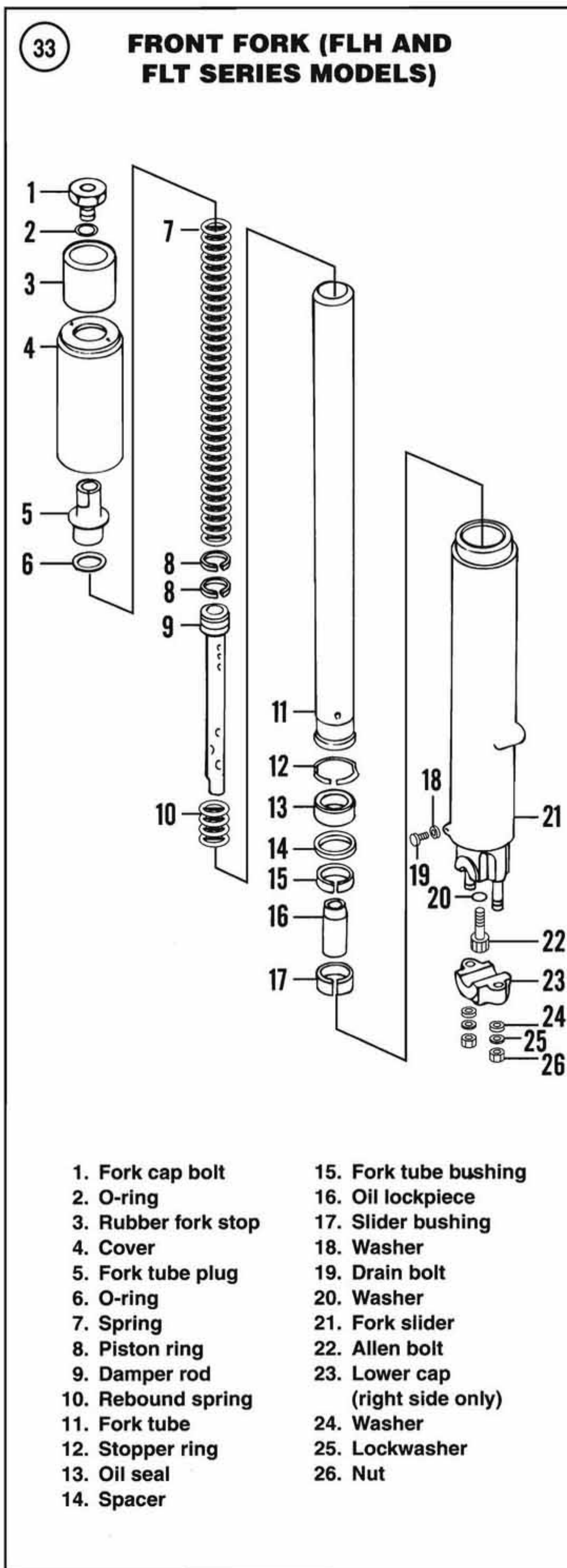
20. Remove the slider from the fork tube. If still in place, remove the oil lock piece from the damper rod.

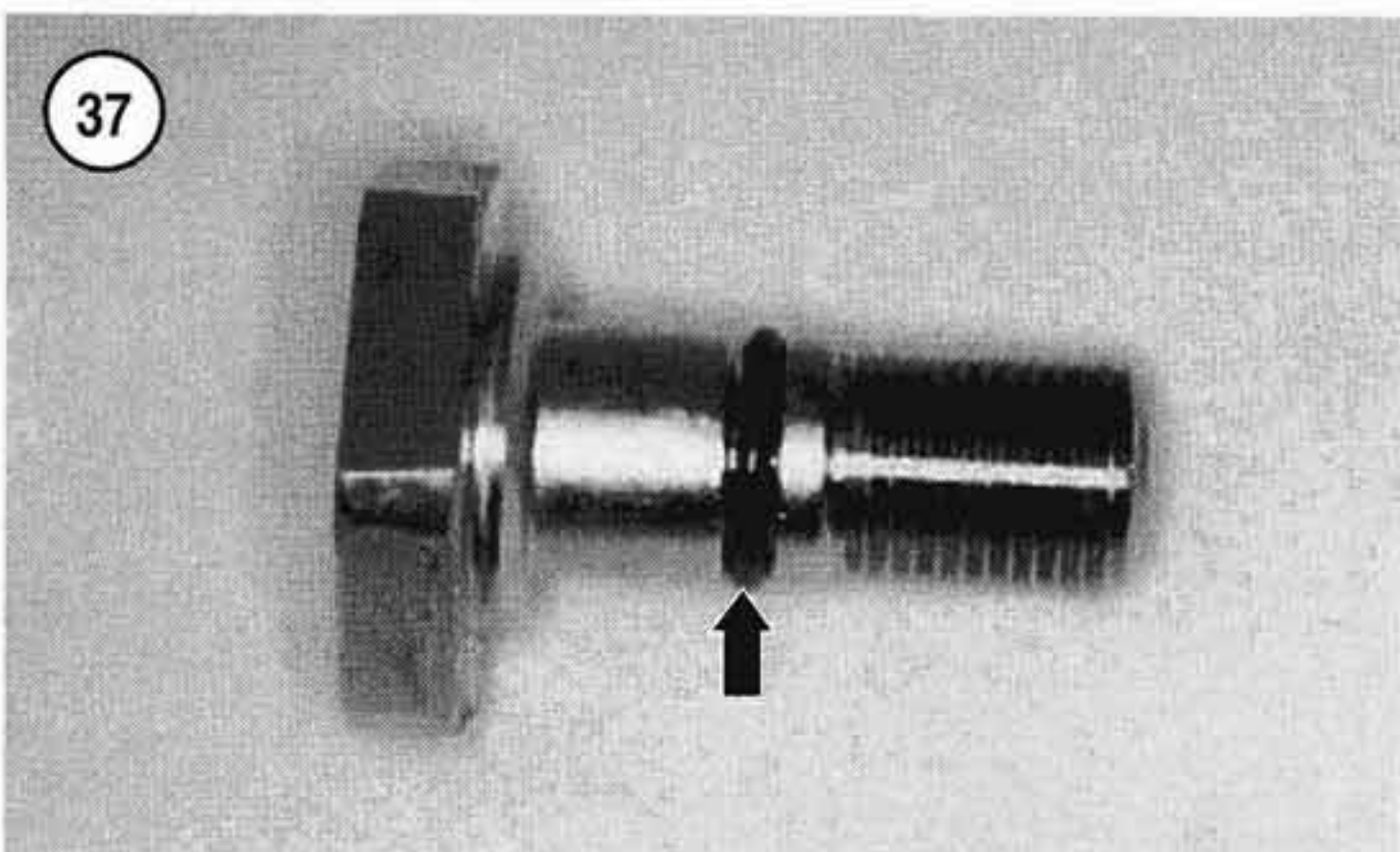
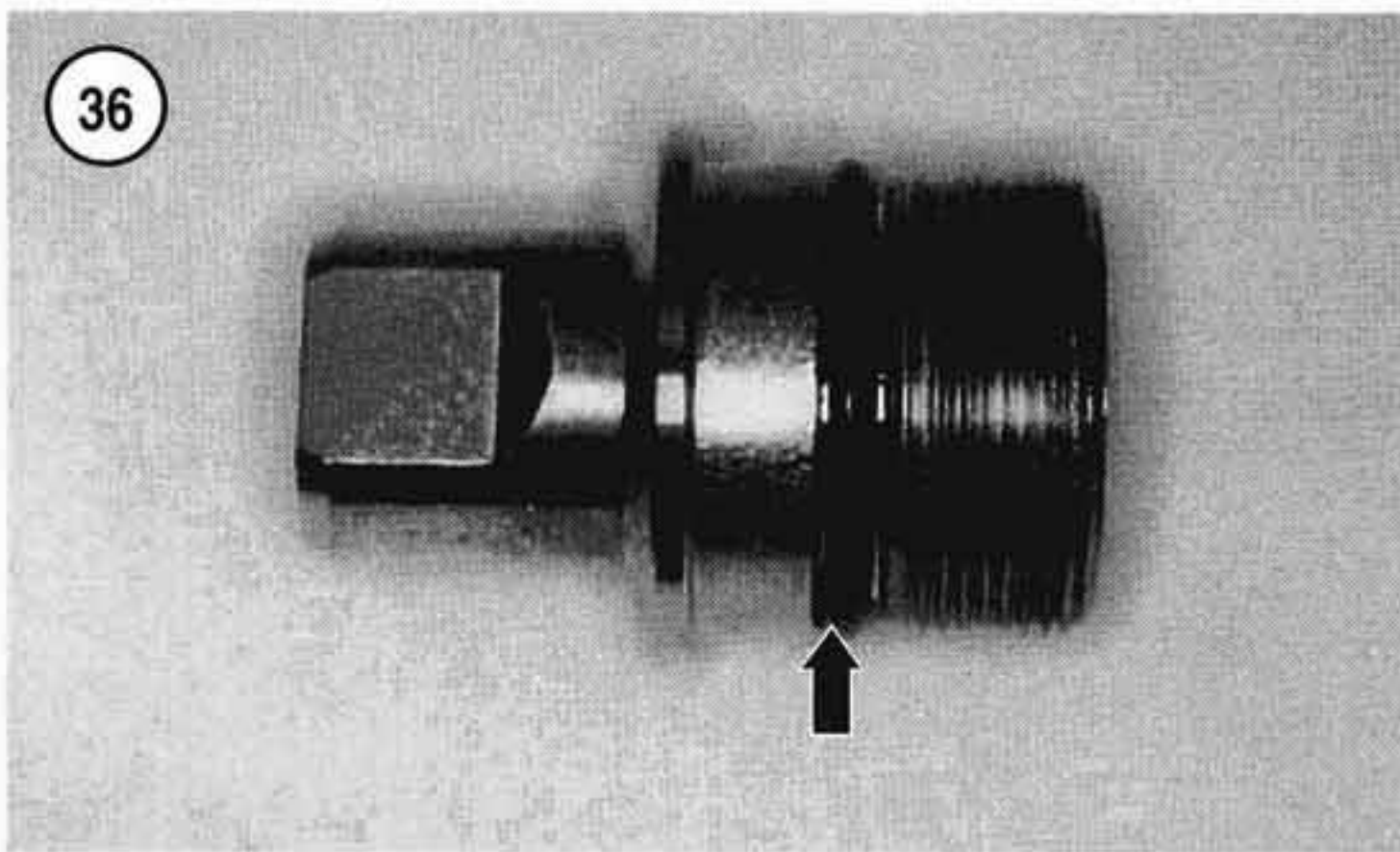
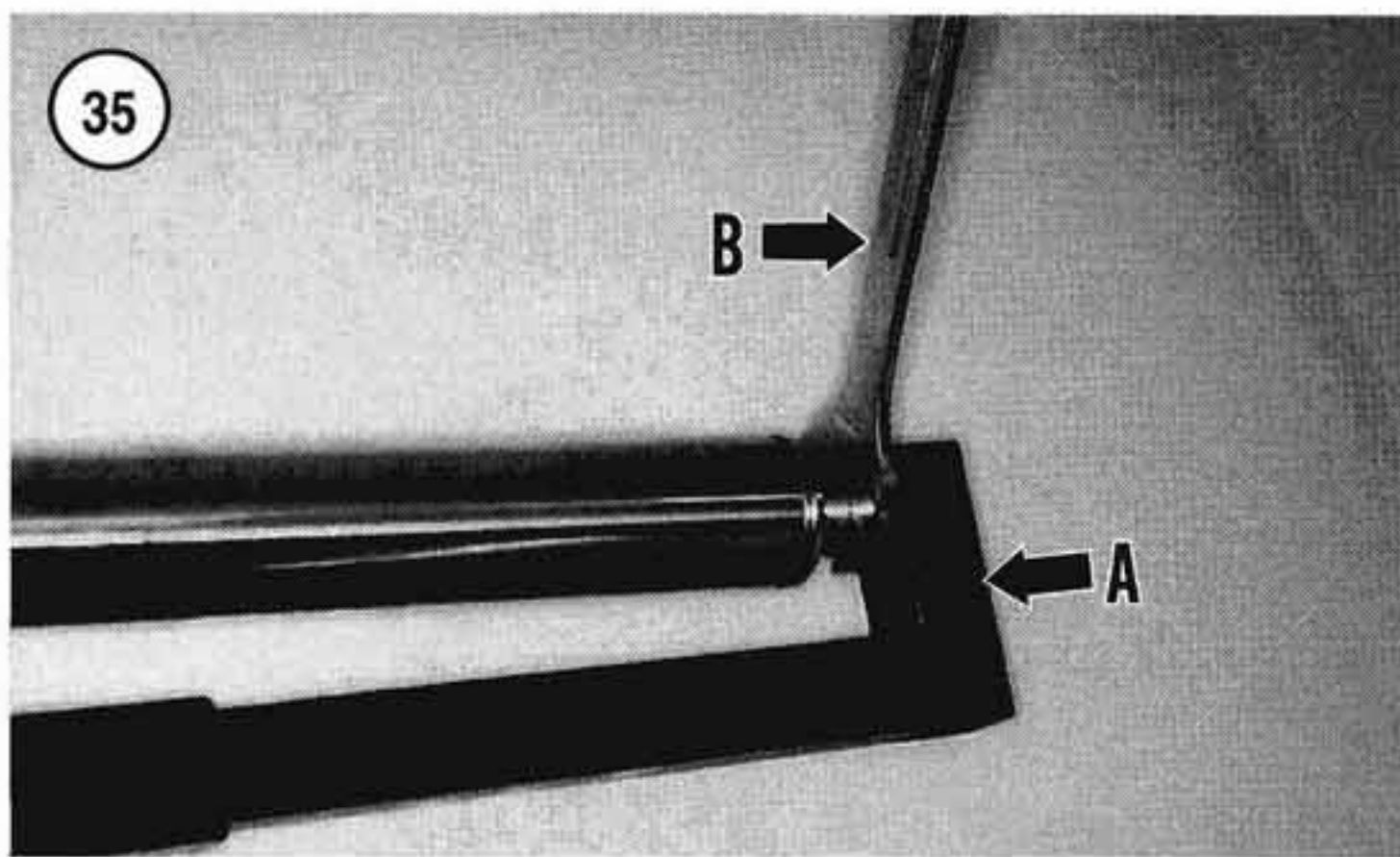
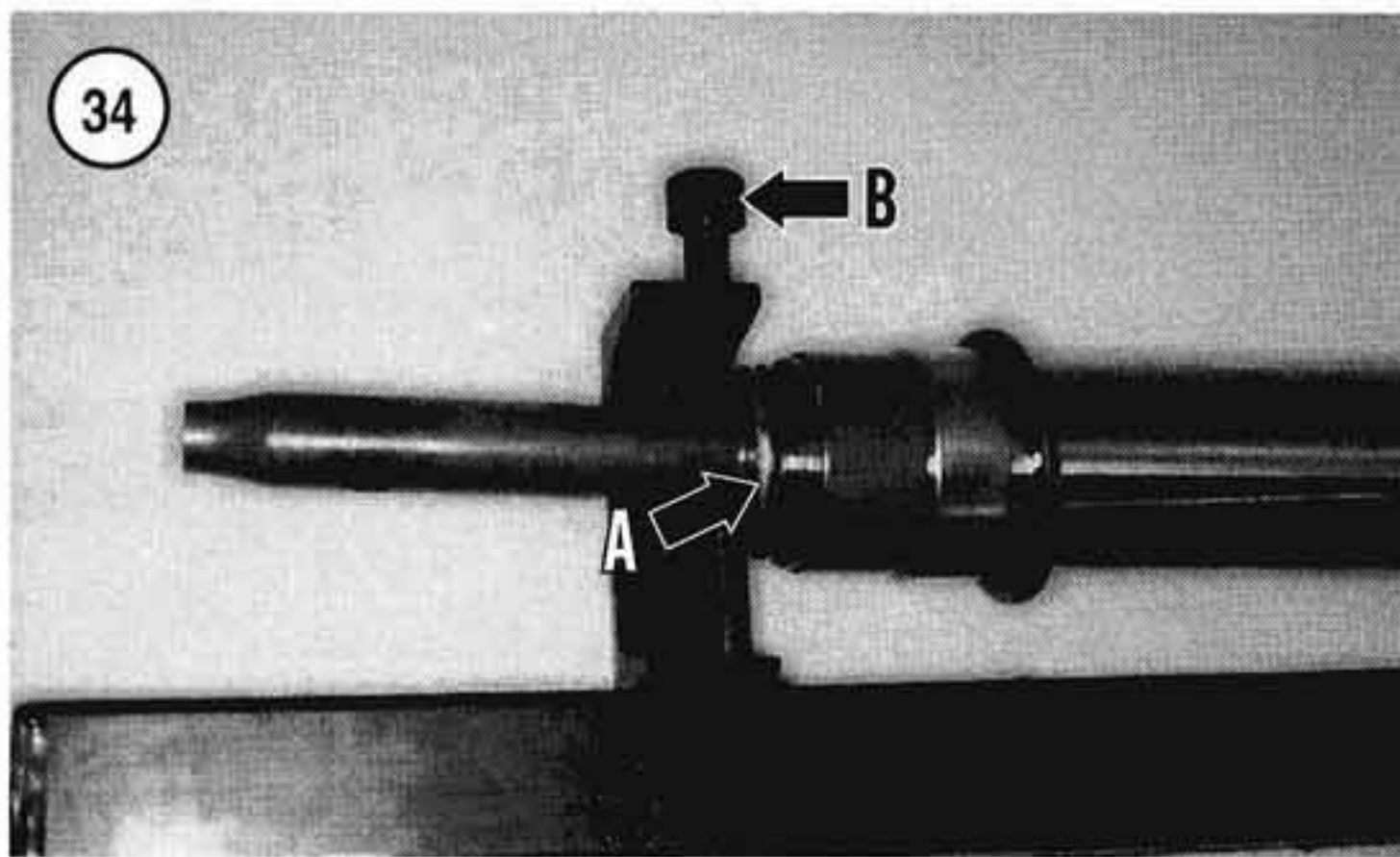
21. Loosen the pinch bolt (**Figure 32**). Slide the fork tube out of the lower fork bracket and remove the rubber stop (**Figure 29**) from the fork tube. It might be necessary to rotate the fork tube slightly while pulling it down and out. Remove the fork assembly and take it to the workbench for service. If the fork is not going to be serviced, wrap it in a bath towel or blanket to protect the surface from damage.

22. Repeat for the other fork assembly.

### Installation (Fork Was Serviced)

1. Assemble the fork as described in this chapter.
2. Install a fork tube through the lower fork bracket and install the rubber fork stop (**Figure 29**).
3. Continue to push the fork tube up through the top fork bracket until it bottoms against the upper fork bracket.
4. Tighten the pinch bolt (**Figure 32**) to 40 ft.-lb. (54 N•m).
5. Install the fork cap bolt (**Figure 27**) onto the top of the fork tube and tighten securely.
6. Install *new* O-rings onto all the hex bolts (**Figure 30**) and apply a light coat of clean engine oil to them.
7. Install the air tube assembly onto the top of the fork assemblies and install the hex bolts through the banjo bolts. Tighten the hex bolts to 97-142 in.-lb. (11-16 N•m).
8. On models so equipped, install the right saddlebag as described in Chapter Fifteen.
9. Install the front fender and front wheel.
- 10A. On all FLHT series models, install the outer fairing. On FLHTC series models, also install the storage box. Refer to Chapter Fifteen.
- 10B. On all FLHR series models, install the headlight nacelle as described in Chapter Nine.
11. Apply the front brake and pump the front fork several times to seat the fork tubes and front wheel.





12. Adjust the front forks air pressure as described in this chapter.

### Disassembly

Refer to **Figure 33**.

#### WARNING

*A special fork-holding tool is required to disassemble and assemble this fork assembly. The fork spring is so strong that it cannot be compressed sufficiently by hand to loosen and remove the fork tube plug. This special tool is available from motorcycle dealerships.*

1. To protect the fork tube, place a steel washer (A, **Figure 34**) over the fork damper rod and against the base of the fork tube.
2. Tighten the lower bolt (B, **Figure 34**) so it seats below the steel washer. Do not overtighten because the damper rod will be damaged. Make sure the tool is indexed properly against the steel washer.
3. Following the manufacturer's instructions, install the special tool upper bolt into the hole in the fork tube plug (A, **Figure 35**). Make sure the tool is indexed properly in the hole in the fork tube plug.

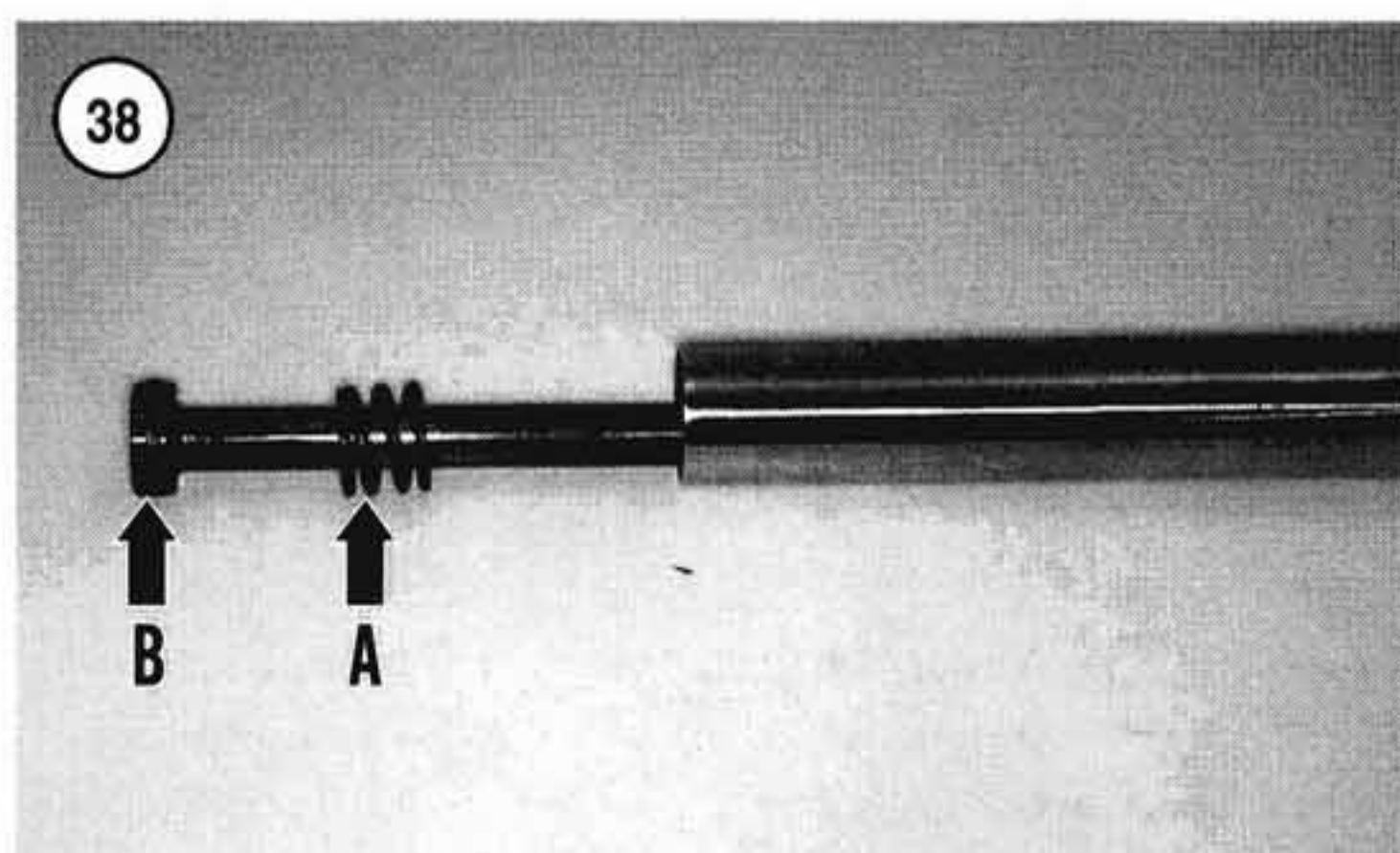
#### WARNING

*Be careful when removing the fork top plug because the spring is under pressure. Protect eyes and face accordingly.*

4. Hold onto the fork tube and loosen the fork tube plug (B, **Figure 35**). Slowly loosen the special tool while unscrewing the fork tube plug.
5. When the fork tube plug is completely unscrewed from the fork tube, loosen and remove the special tool from the fork assembly.
6. Remove the fork tube plug and fork spring and drain out any residual fork oil. Dispose of the fork oil properly.
7. Turn the fork tube upside down and remove the damper rod and rebound spring.
8. Inspect all parts as described in this section.

### Assembly

1. Install a new O-ring onto the fork top plug (**Figure 36**).
2. Install a new O-ring onto on the fork cap bolt (**Figure 37**).
3. Before assembly, coat all parts with Harley-Davidson Type E Fork Oil or an equivalent fork oil.



4. Install the rebound spring (A, **Figure 38**) onto the damper rod and slide the damper rod (B) into the fork tube until it extends out the end of the fork tube.

5. Install the oil lock piece (**Figure 39**) onto the end of the damper rod.

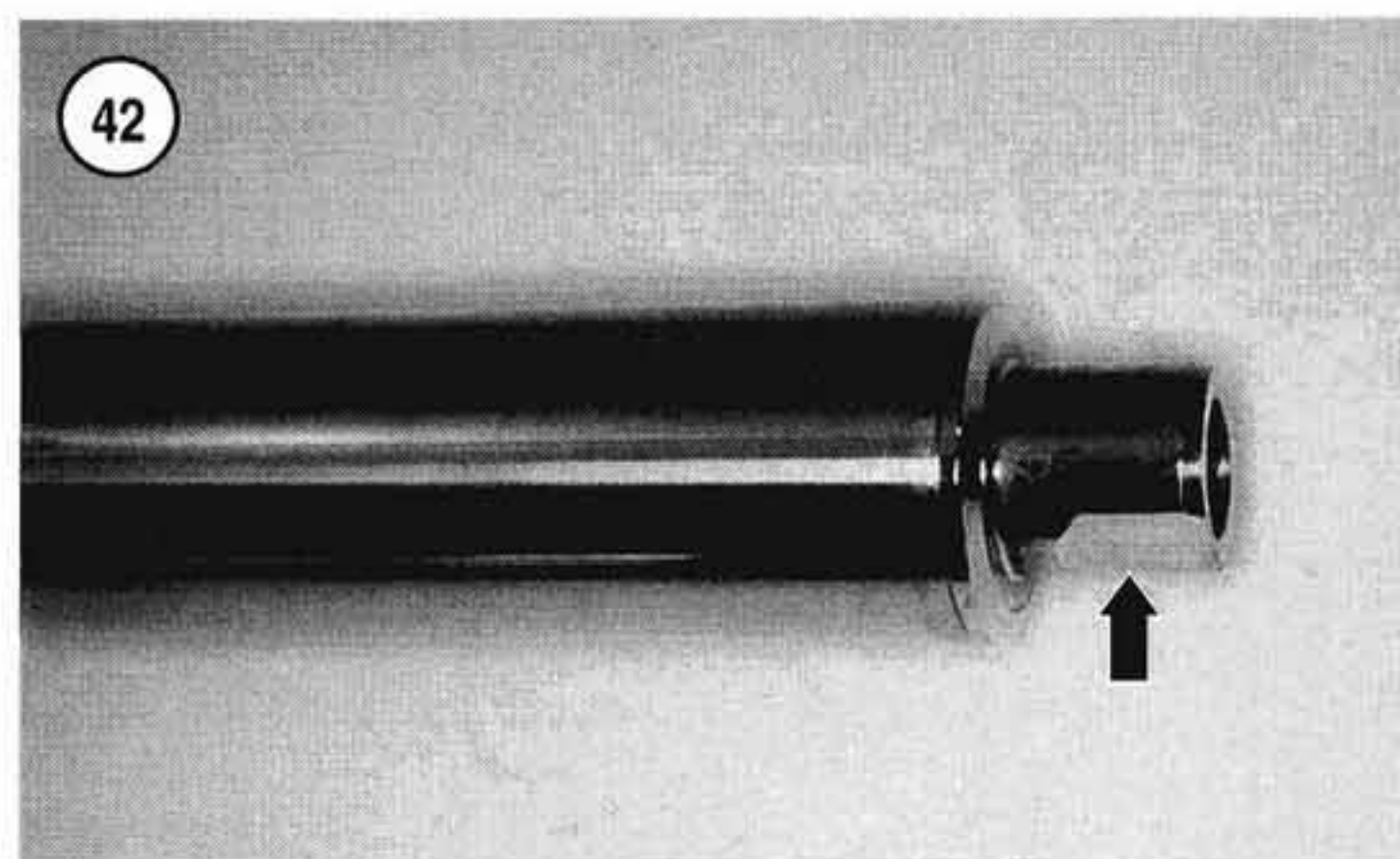
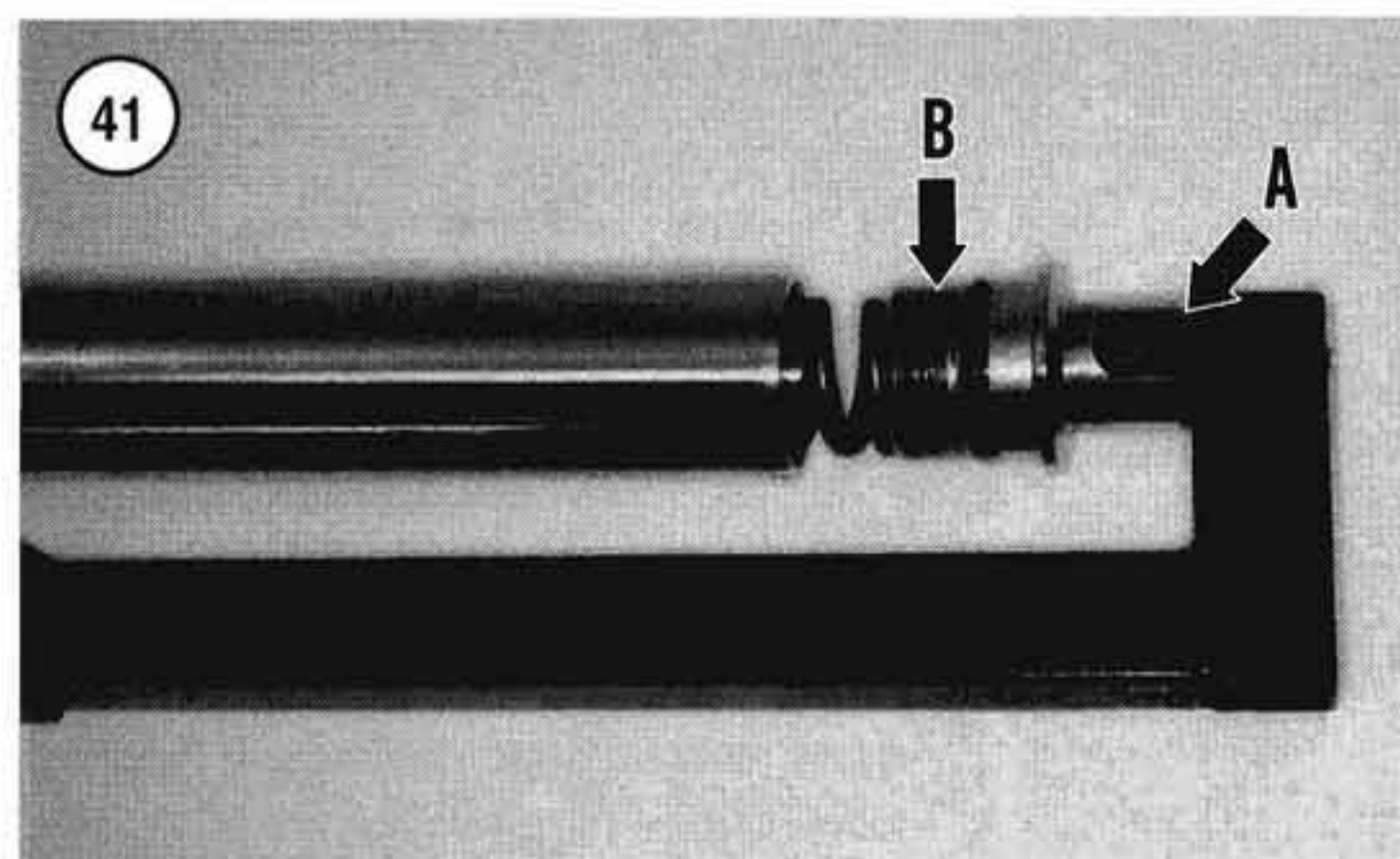
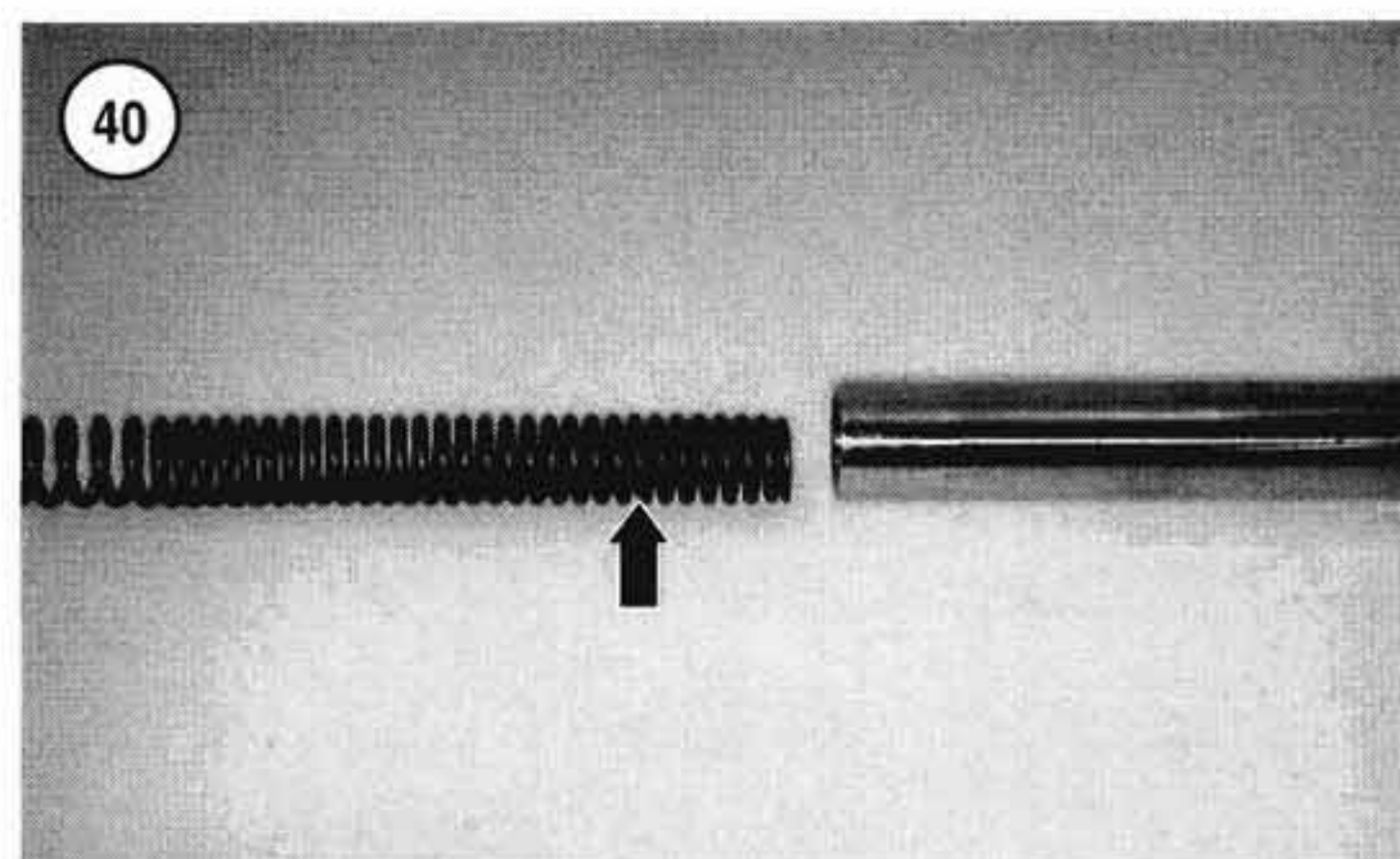
6. Position the fork spring with the closer wound coils going in first (**Figure 40**) and install the fork spring into the fork tube.

7. To protect the fork tube, place a steel washer (A, **Figure 34**) over the fork damper rod and up against the base of the fork tube.

8. Tighten the lower bolt (B, **Figure 34**) so it seats below the steel washer. Do not overtighten because the damper rod will be damaged. Make sure the tool is indexed properly against the steel washer.

9. Position the fork tube plug onto the top of the fork spring.

10. Install the special tool upper bolt into the hole in the fork tube plug (A, **Figure 41**) following the manufacturer's instructions. Make sure the tool is indexed properly in the hole in the fork tube plug.



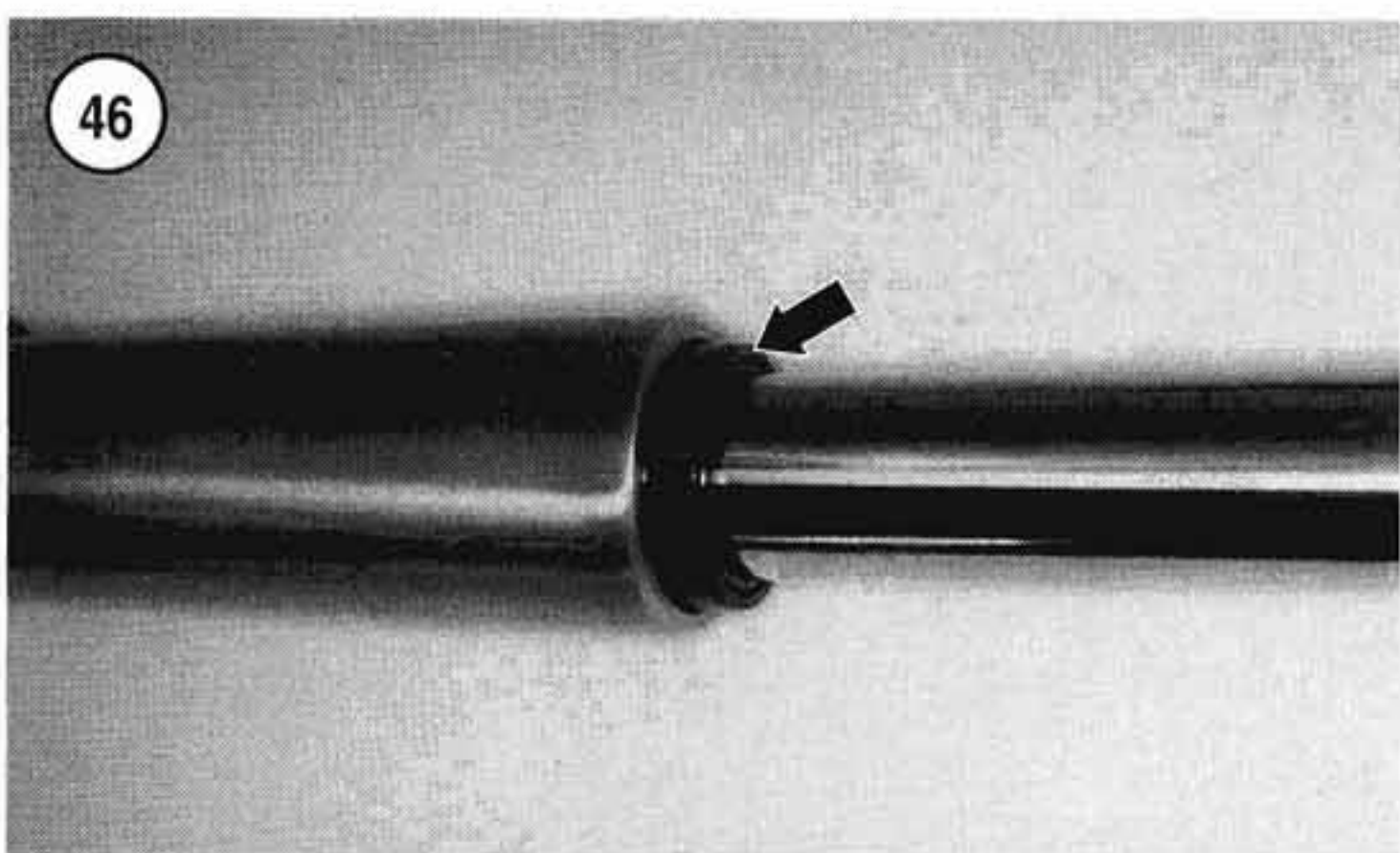
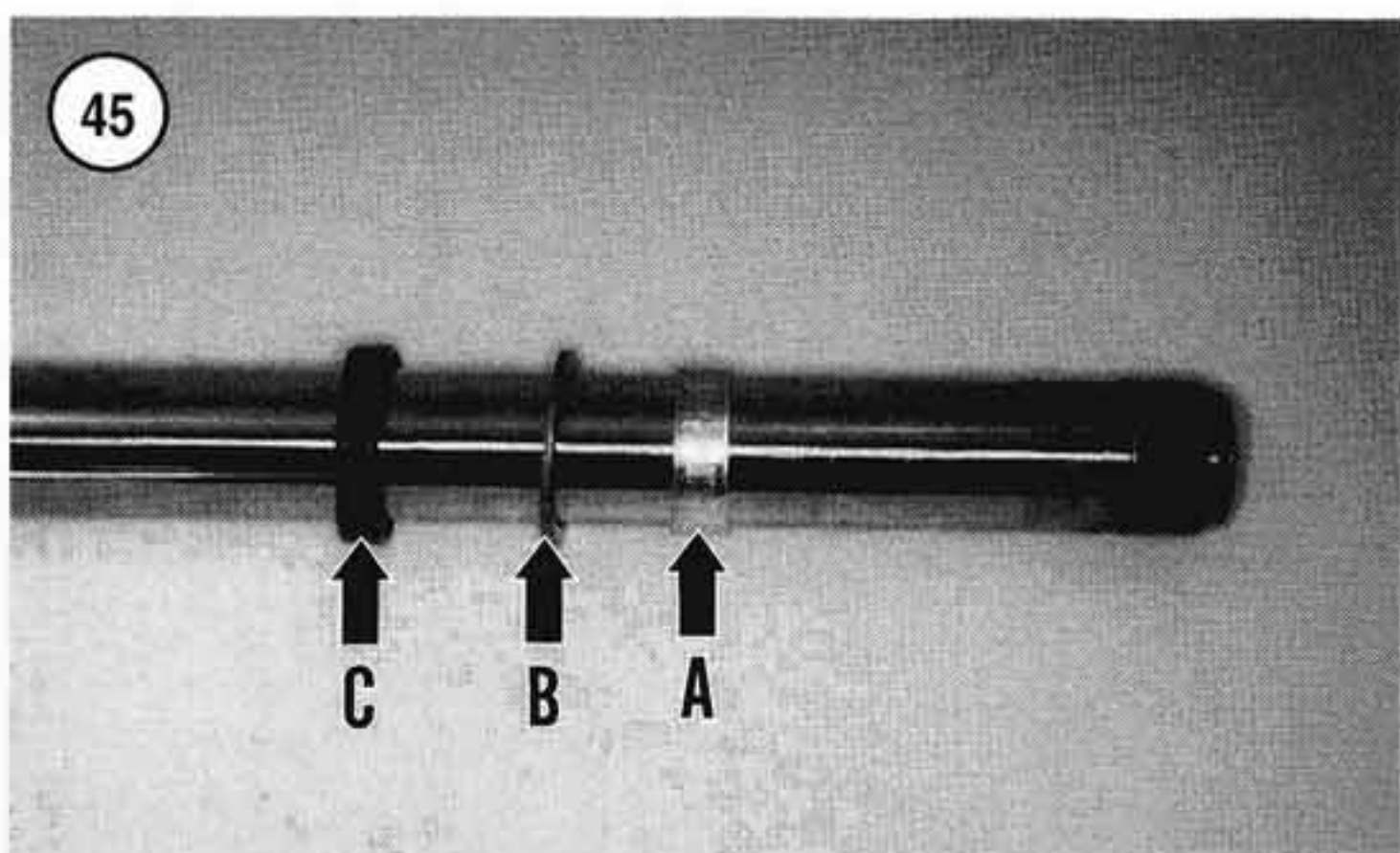
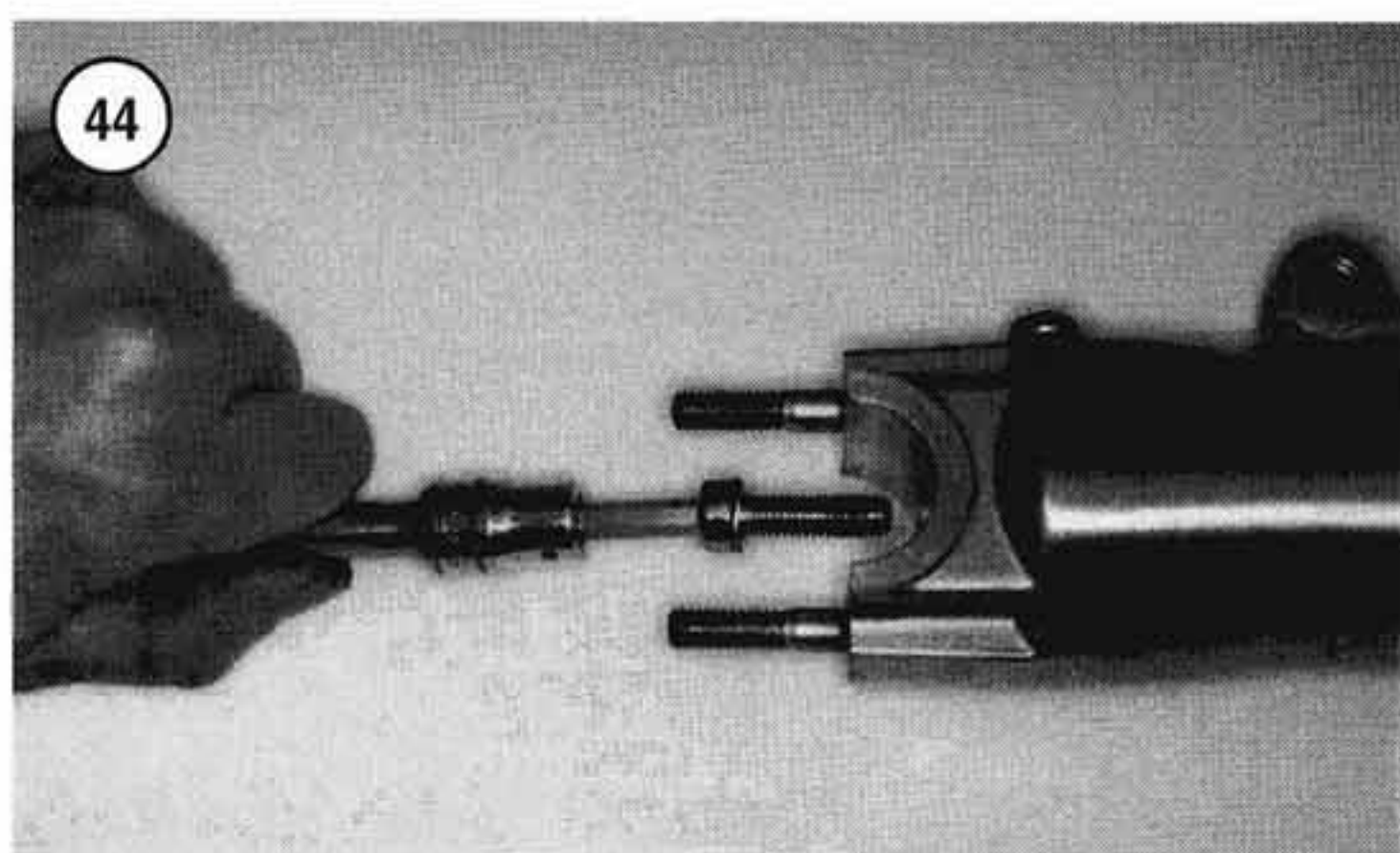
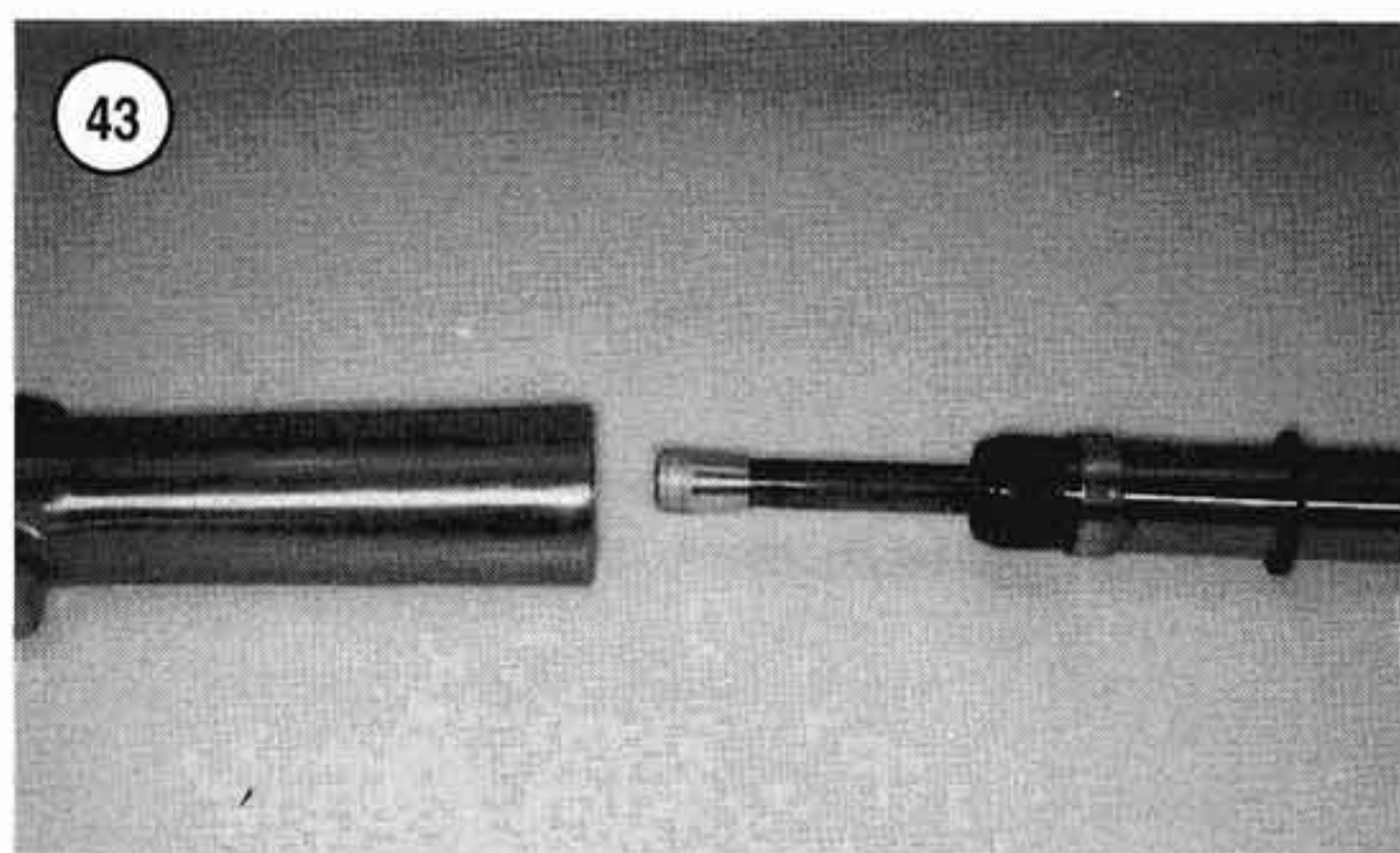
11. Hold the fork tube plug and slowly tighten the special tool while guiding the fork tube plug into the top of the fork tube (B, **Figure 41**).

12. Place a wrench on the fork tube plug (B, **Figure 35**) and screw the fork tube plug into the fork tube while tightening the special tool. Once the fork tube plug has started to thread into the fork tube, loosen the special tool and remove it from the fork assembly.

13. Place the slider in a vise with soft jaws and securely tighten the fork top plug (**Figure 42**).

#### CAUTION

*While tightening the special tool, do not jam the fork tube plug into the threaded portion of the fork tube. Doing so will damage the threads on either or both parts.*



14. Push the fork slider and damper rod (**Figure 43**) into the fork slider. Insert a Phillips screwdriver through the opening in the bottom of the fork slider and guide the damper rod end into the receptacle in the base of the slider. Remove the screwdriver.

15. Install a new washer onto the damper rod Allen bolt.

16. Apply a nonpermanent threadlocking compound to the damper rod Allen bolt threads prior to installation. Insert the Allen bolt (**Figure 44**) through the lower end of the slider and thread it into the damper rod. Tighten the bolt securely.

#### CAUTION

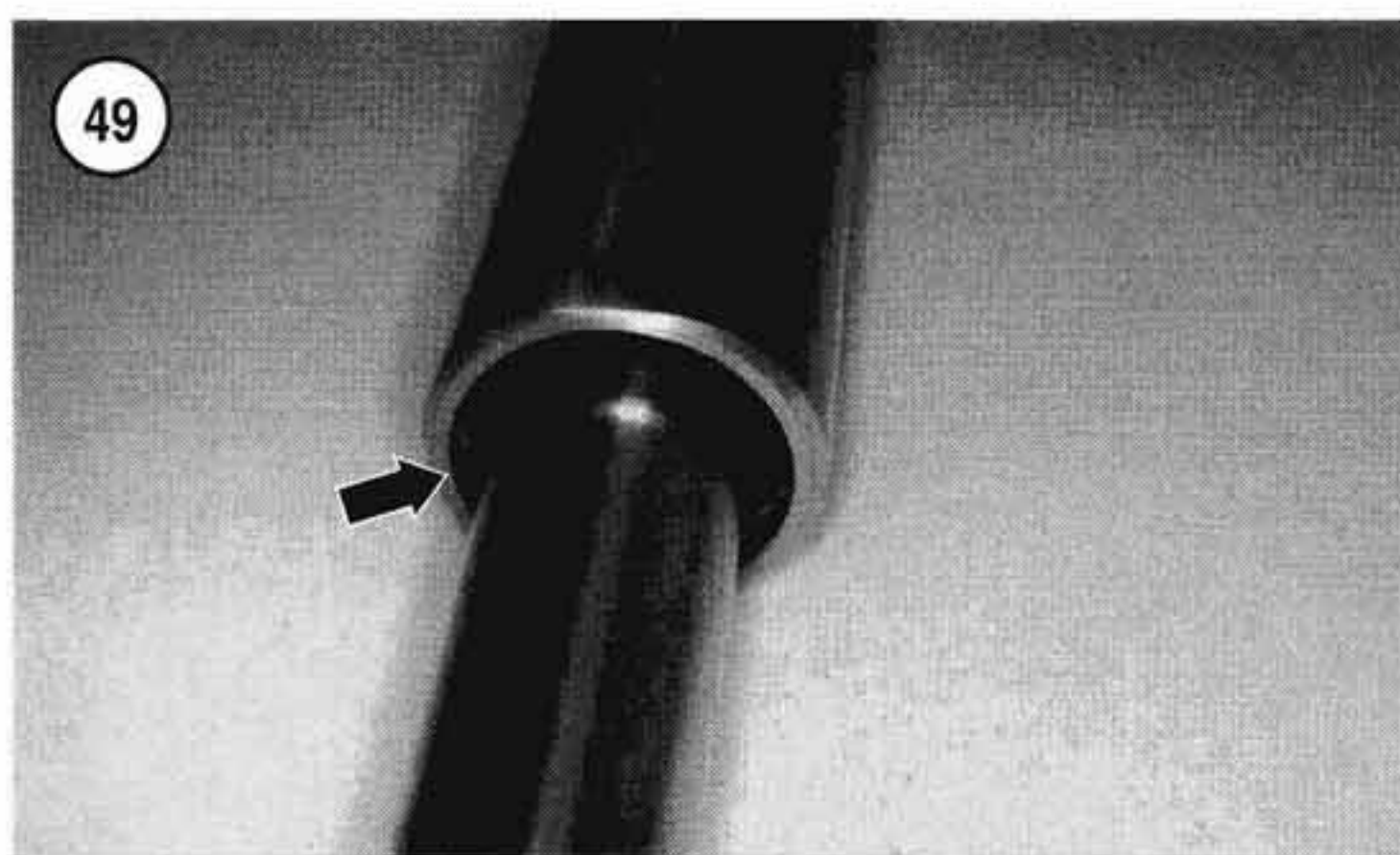
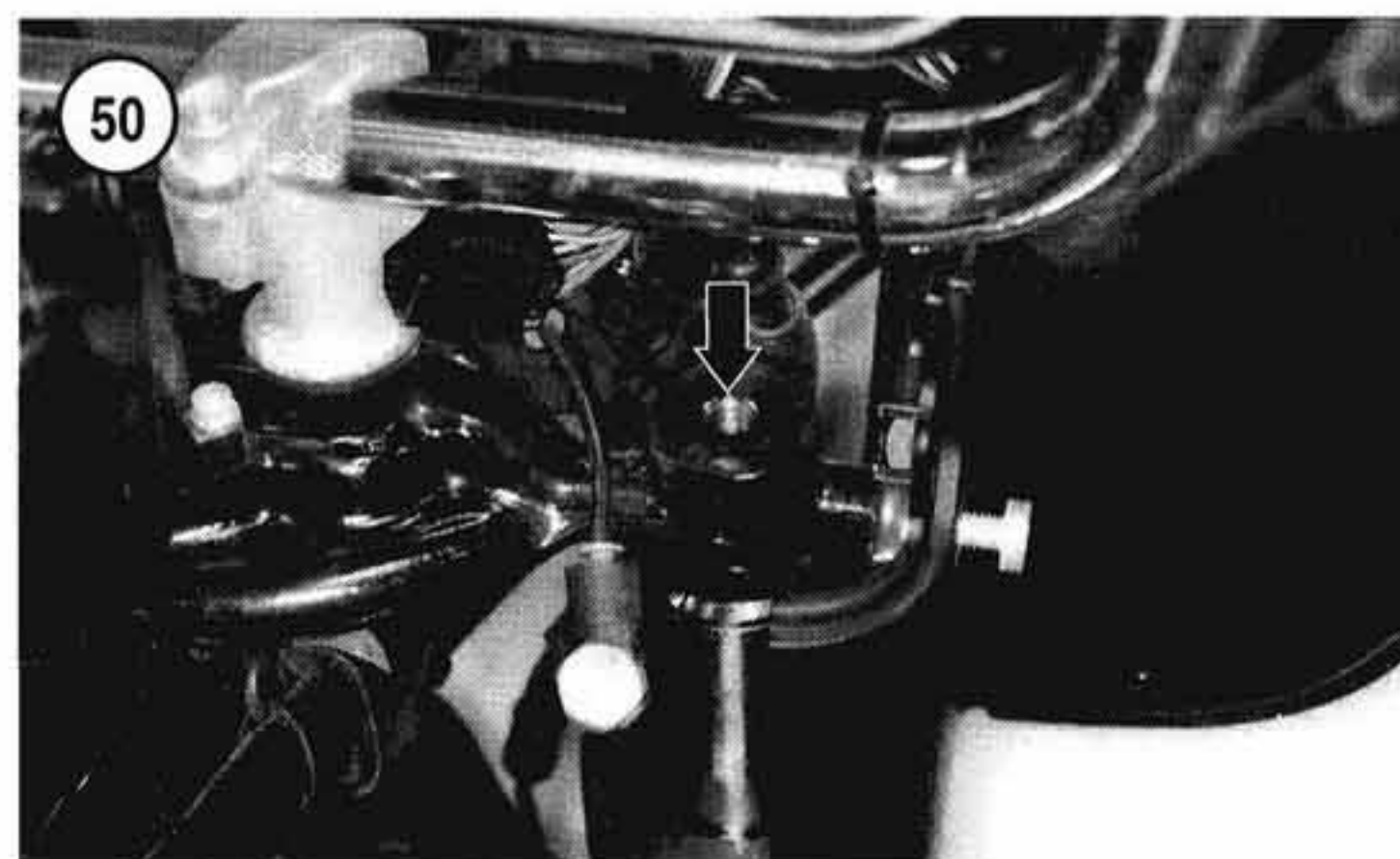
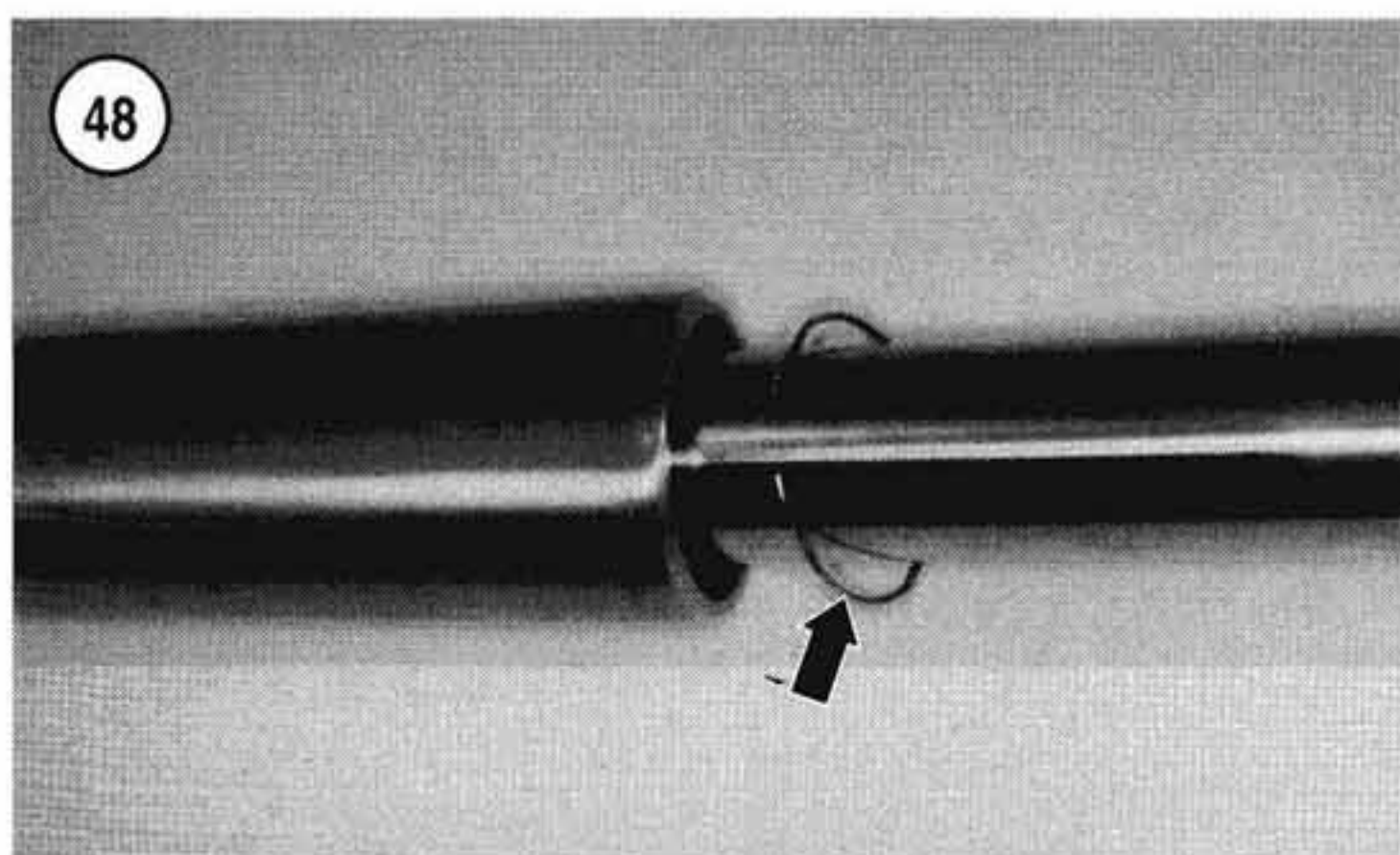
*To protect the oil seal lips, place a thin plastic bag on top of the fork tube. Before installing the seal in the following steps, lightly coat the bag and the seal lips with fork oil.*

17. Slide the fork slider bushing (A, **Figure 45**), oil seal spacer (B) and oil seal (C) (with the letters facing up) down into the fork tube receptacle (**Figure 46**).

#### NOTE

*A fork seal driver is required to install the fork tube bushing and seal into the fork tube. A number of different aftermarket fork seal drivers are available that can be used for this purpose. Another method is to use a piece of pipe or metal collar with correct dimensions to slide over the fork tube and seat against the seal. When selecting or fabricating a driver tool, it must have sufficient weight to drive the bushing and oil seal into the fork tube. A fork seal and cap installer (JIMS part No. 2046) is used for this procedure.*

18. Slide the fork seal driver down the fork tube and seat it against the oil seal (**Figure 47**).

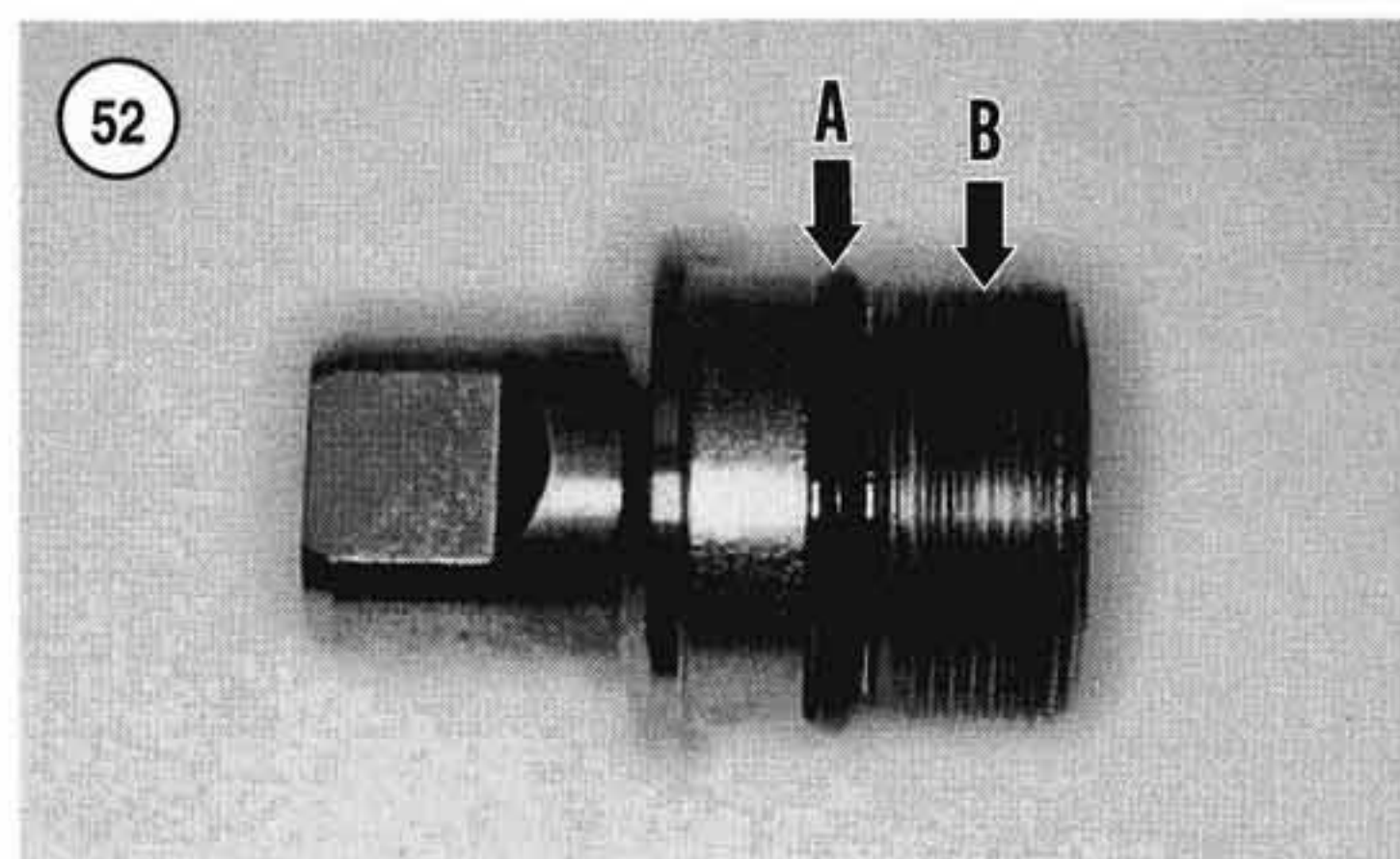


19. Operate the driver and drive the fork slider bushing and new seal into the fork tube. Continue to operate the driver until the stopper ring groove in the tube is visible above the fork seal. Remove the fork seal driver tool.

20. Install the stopper ring (**Figure 48**) into the slider groove. Make sure the retaining ring seats in the groove (**Figure 49**).

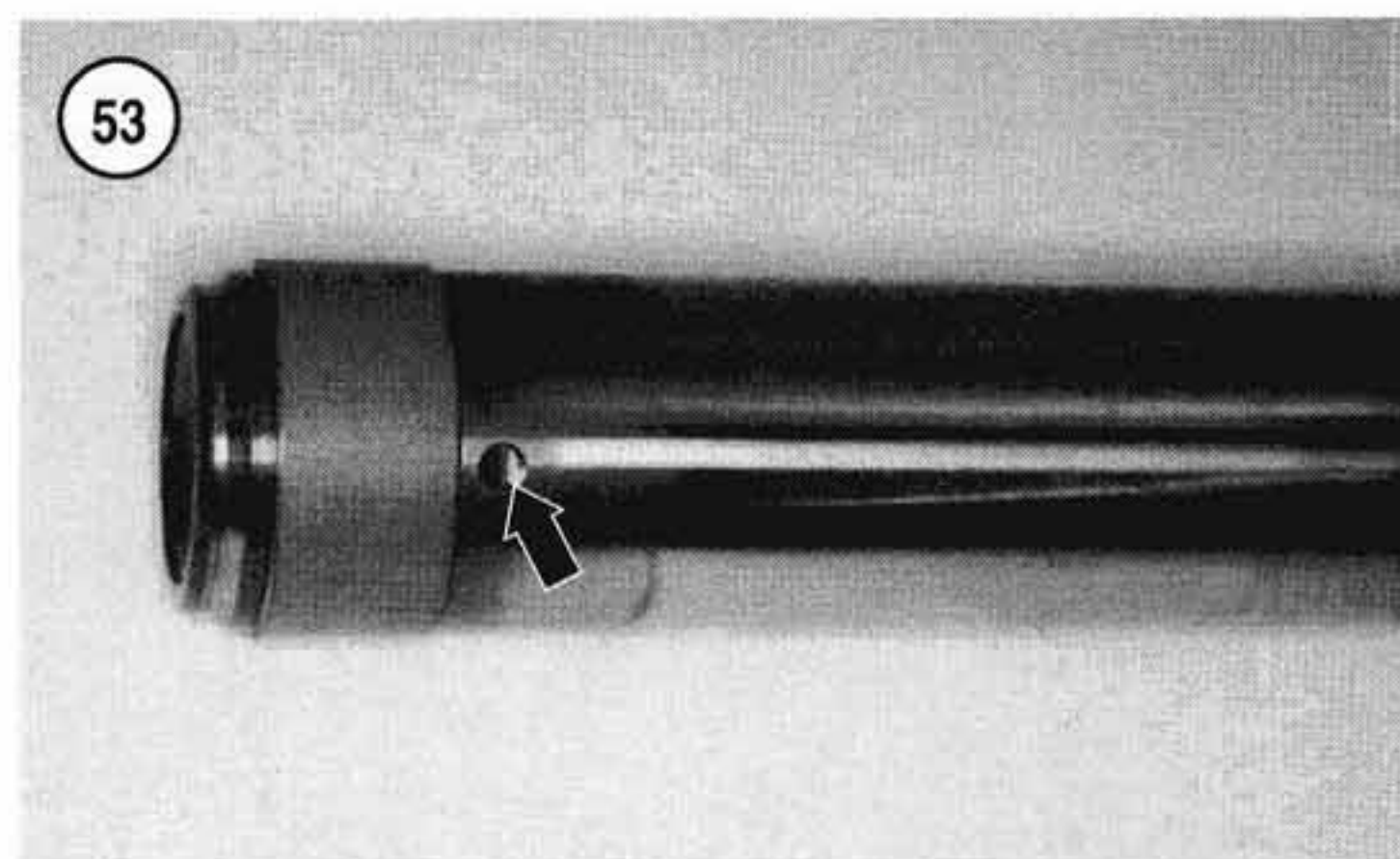
21. Install the fork tube as described in this chapter.

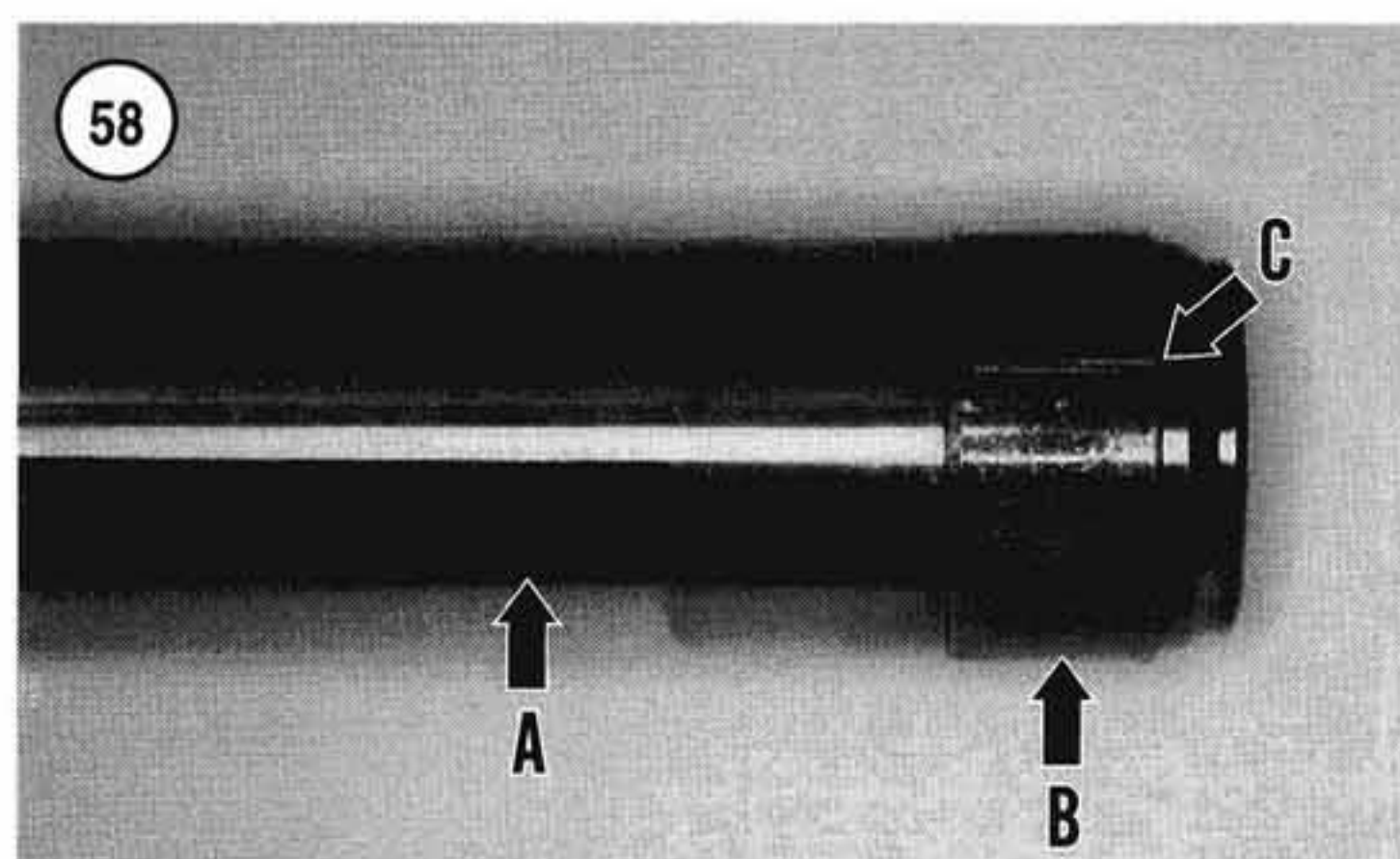
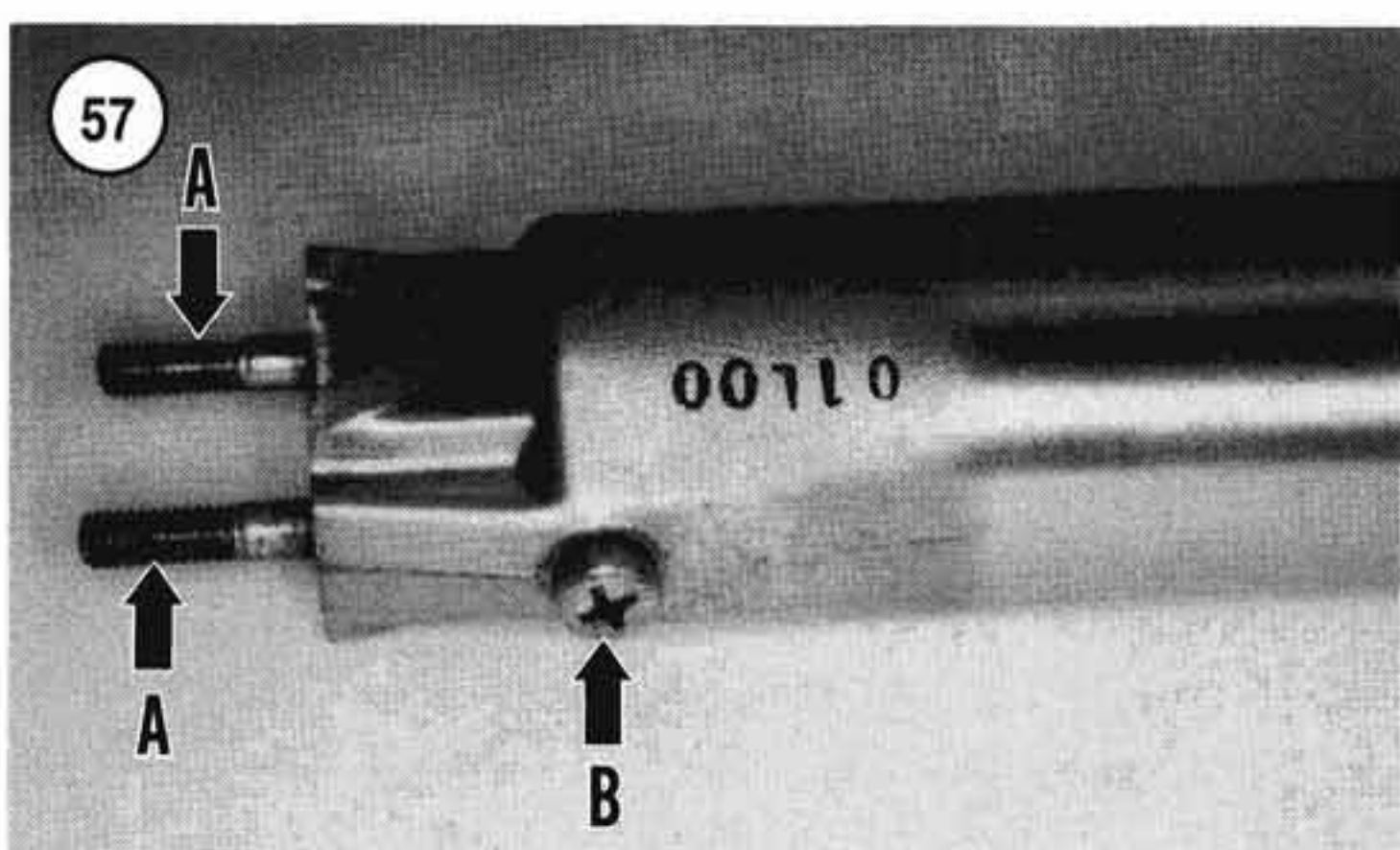
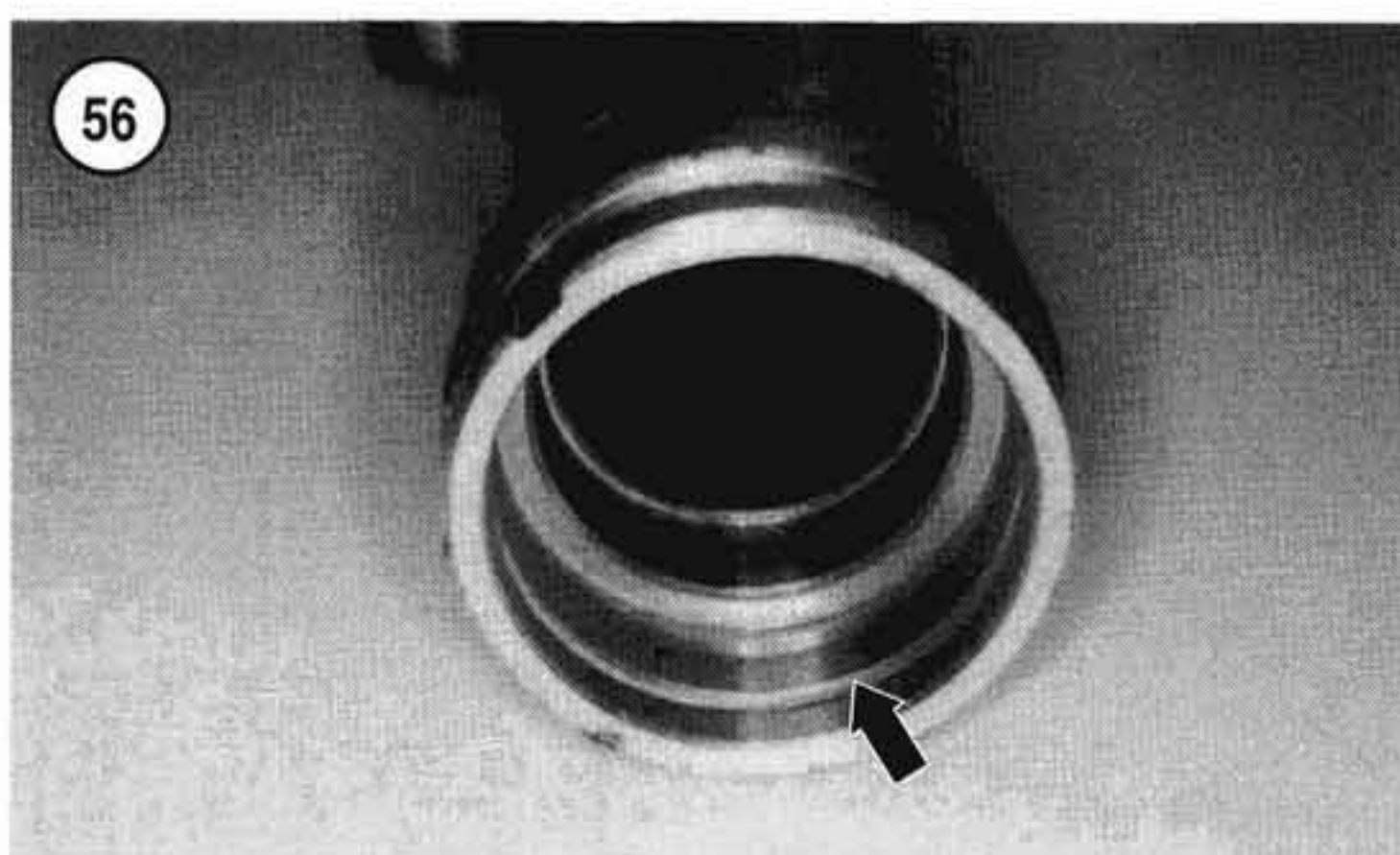
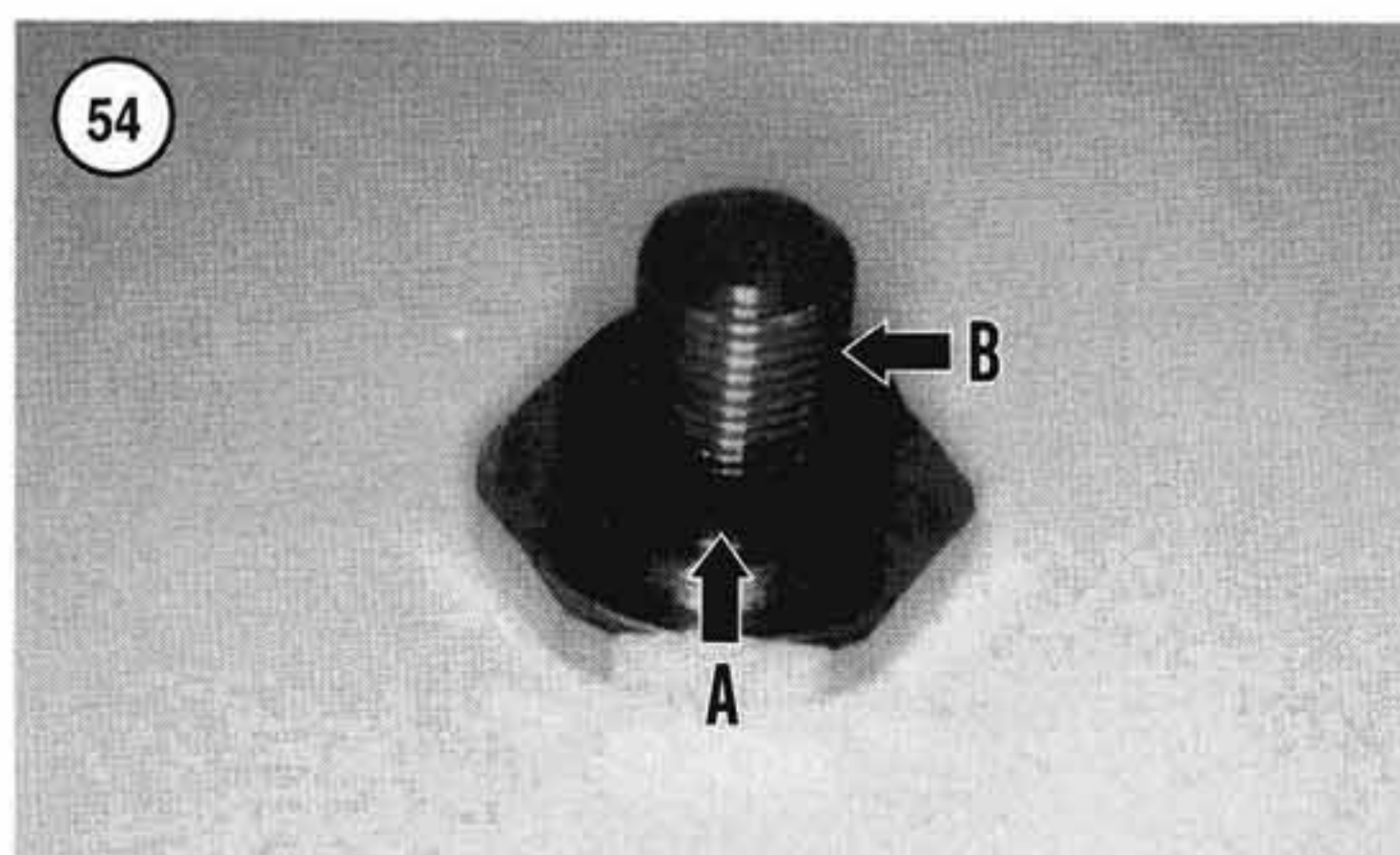
22. Insert a clear plastic tube into the fork cap bolt opening (**Figure 50**). Attach a funnel to the plastic tube and refill each fork leg with the correct viscosity and quantity of fork oil in **Table 1**. Remove the small funnel and plastic tube.



### INSPECTION (ALL MODELS)

1. Thoroughly clean all parts in solvent and dry them. Check the fork tube for signs of wear or scratches.
2. Check the fork tube for bending, nicks, rust or other damage. Place the fork tube on a set of V-blocks and check runout with a dial indicator. If the special tools are not available, roll the fork tube on a large plate glass or another flat surface. Harley-Davidson does not provide service specifications for runout.





3. Check the internal threads in the top of the fork tube (**Figure 51**) for stripping, cross-threading or sealer residue. Use a tap to true the threads and to remove sealer deposits.
4. Check the fork tube plug O-ring (A, **Figure 52**) for hardness or deterioration. Replace if necessary.
5. Check the external threads on the fork tube plug (B, **Figure 52**) for stripping, cross-threading or sealer residue. Use a die to true the threads and to remove sealer deposits.
6. Make sure the oil passage hole in the fork tube (**Figure 53**) is open. If it is clogged, flush it with solvent and dry it with compressed air.
7. Check the fork cap bolt O-ring (A, **Figure 54**) for hardness or deterioration. Replace if necessary.
8. Check the external threads on the fork cap (B, **Figure 54**) for stripping, cross-threading or sealer residue. Use a die to true the threads and to remove sealer deposits.
9. Check the slider (**Figure 55**) for dents or other exterior damage. Check the retaining ring groove (**Figure 56**) in the top of the slider for cracks or other damage.
10. Check the front caliper mounting bosses for cracks or damage.
11. Check the threaded studs (A, **Figure 57**) on the base of the slider for thread damage. Repair if necessary.
12. Check the drain screw (B, **Figure 57**) and washer for damage.
13. Check the slider (A, **Figure 58**) and fork tube bushings (B) for excessive wear, cracks or damage.
14. Remove the fork tube bushing as follows:
  - a. Expand the bushing slit (C, **Figure 58**) with a screwdriver and slide the bushing off the fork tube.
  - b. Coat the new bushing with new fork oil.
  - c. Install the new bushing by expanding the slit with a screwdriver.
  - d. Seat the new bushing into the fork tube groove.

15. Check the damper rod piston rings (A, **Figure 59**) for excessive wear, cracks or other damage. If necessary, replace both rings as a set.

16. Check the damper rod (B, **Figure 59**) for straightness with a set of V-blocks and a dial indicator (**Figure 60**), or by rolling it on a piece of plate glass. Specifications for runout are not available. If the damper rod is not straight, replace it.

17. Make sure the oil passage hole in the damper rod (C, **Figure 59**) is open. If it is clogged, flush it with solvent and dry it with compressed air.

18. Check the internal threads in the bottom of the damper rod for stripping, cross-threading or sealer residue. Use a tap to true the threads and to remove sealer deposits.

19. Check the damper rod rebound spring and the fork spring for wear or damage. Service limit specifications for spring free length are not available. If necessary, replace both fork springs as a set.

20. Replace the oil seal whenever it is removed. Always replace both oil seals as a set.

### FRONT FORK AIR CONTROL AND ANTIDIVE SYSTEM (ADJUSTMENT AND INSPECTION)

All FLH, FLT and some FXR series models are equipped with a front fork air control/antidive system. This system uses air pressure to reduce fork compression during braking. The amount of antidive is dependent on the amount of air pressure applied to the system.

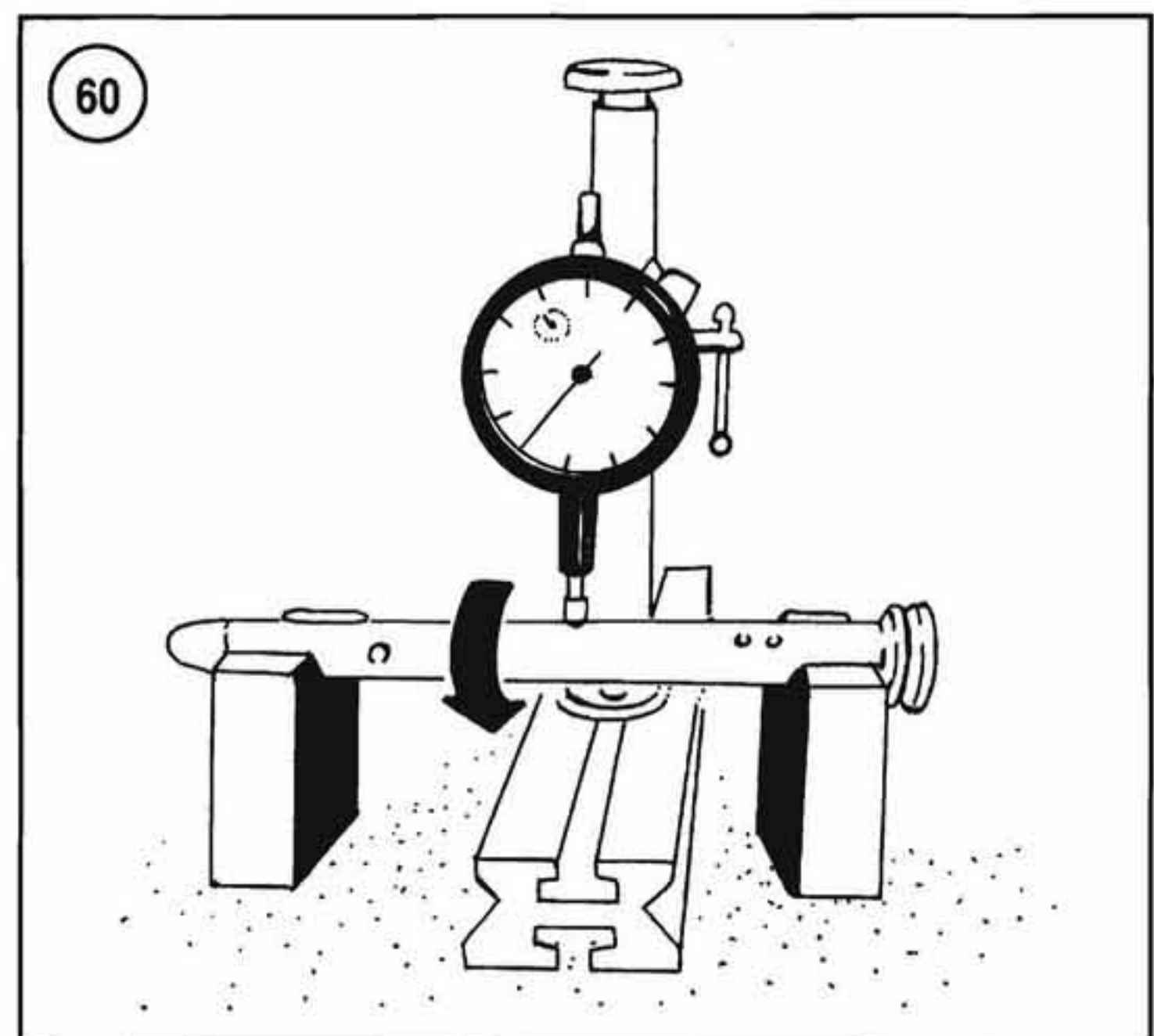
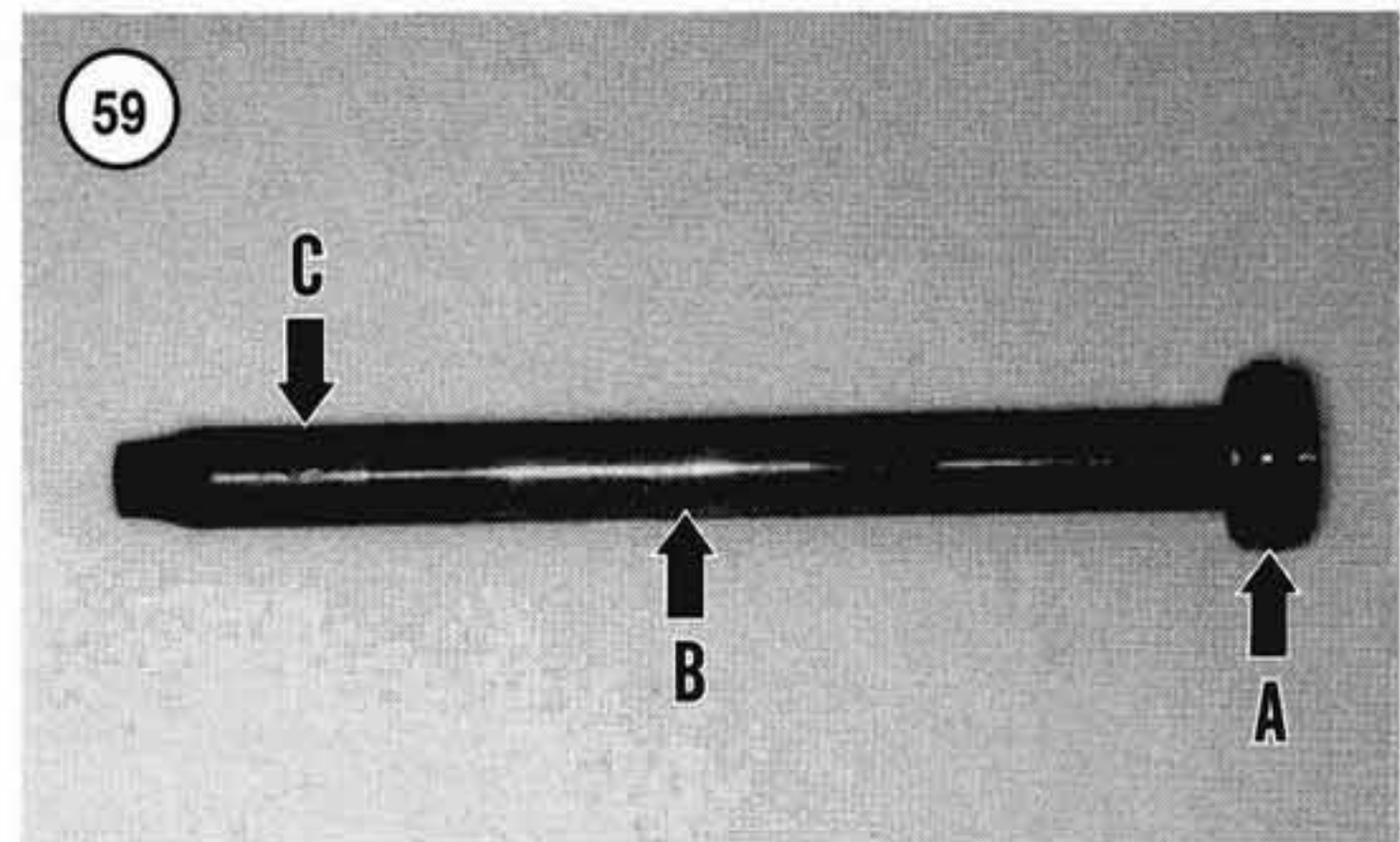
#### Air Pressure Adjustment

##### 1996-1998 FLH and FLT series models

#### WARNING

*Use caution when releasing the air from the front fork and the front fork air valve. Moisture and/or fork oil might spurt out when the air pressure is released. Protect eyes accordingly.*

1. Place the motorcycle on the jiffy stand.
2. Remove the right saddlebag as described in Chapter Fifteen.
3. Remove the front air valve cap (**Figure 61**).
4. Use a no-loss air gauge to check air pressure. Refer to the recommended air pressure listed in **Table 4**.
5. Increase or decrease air pressure to achieve the desired ride and control.



6. At the same time, check and adjust, if necessary, the air pressure in the rear shock absorbers.

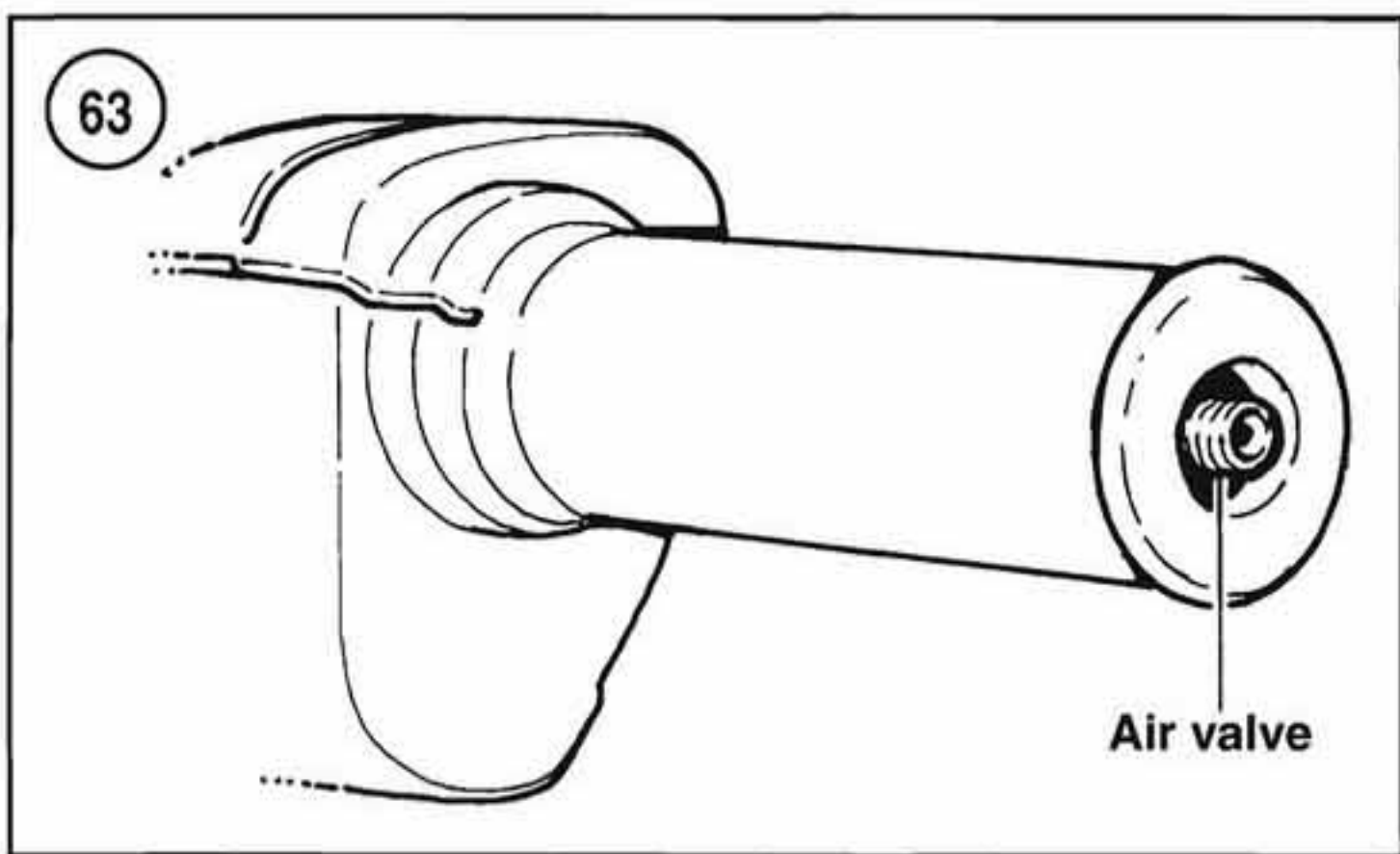
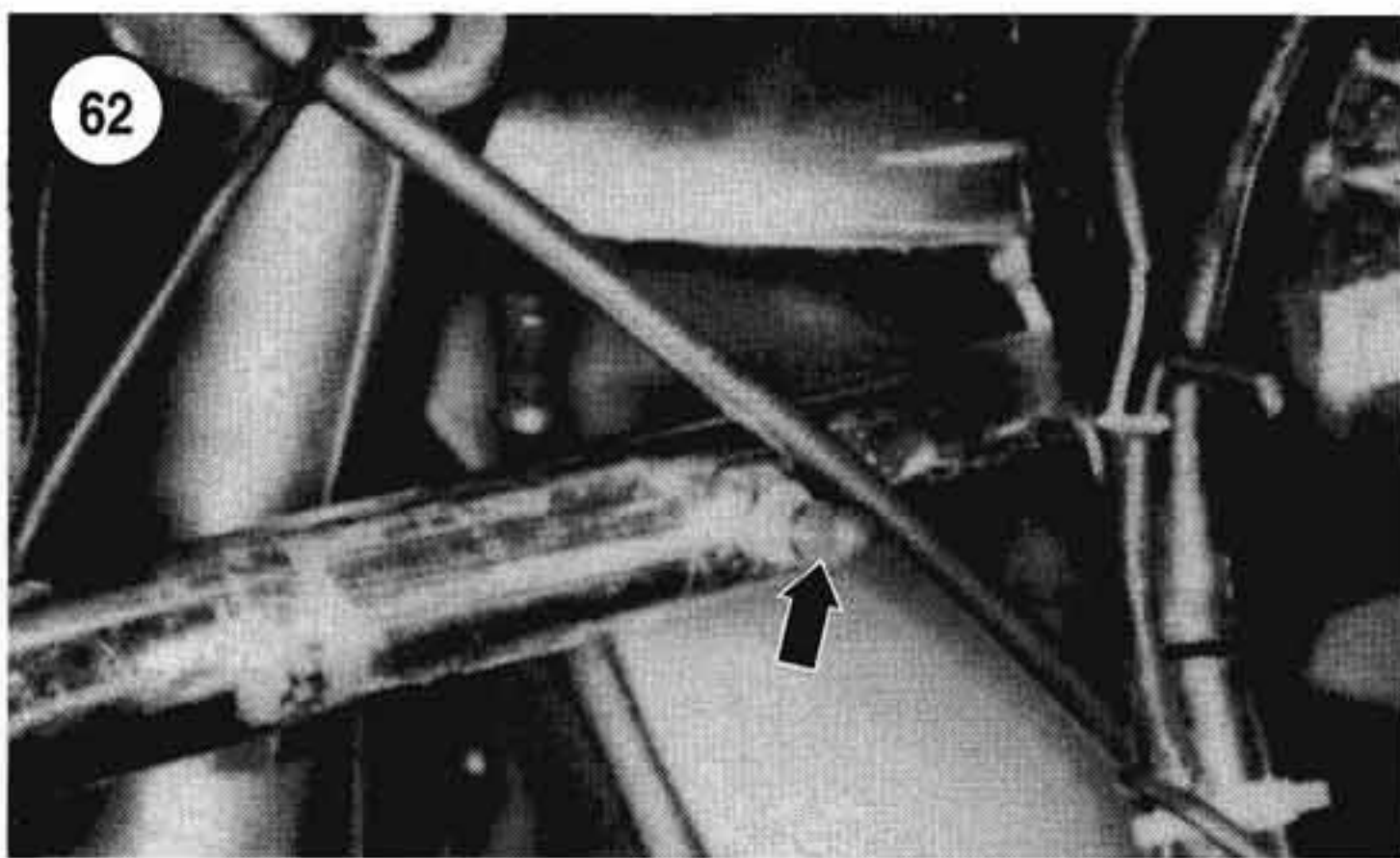
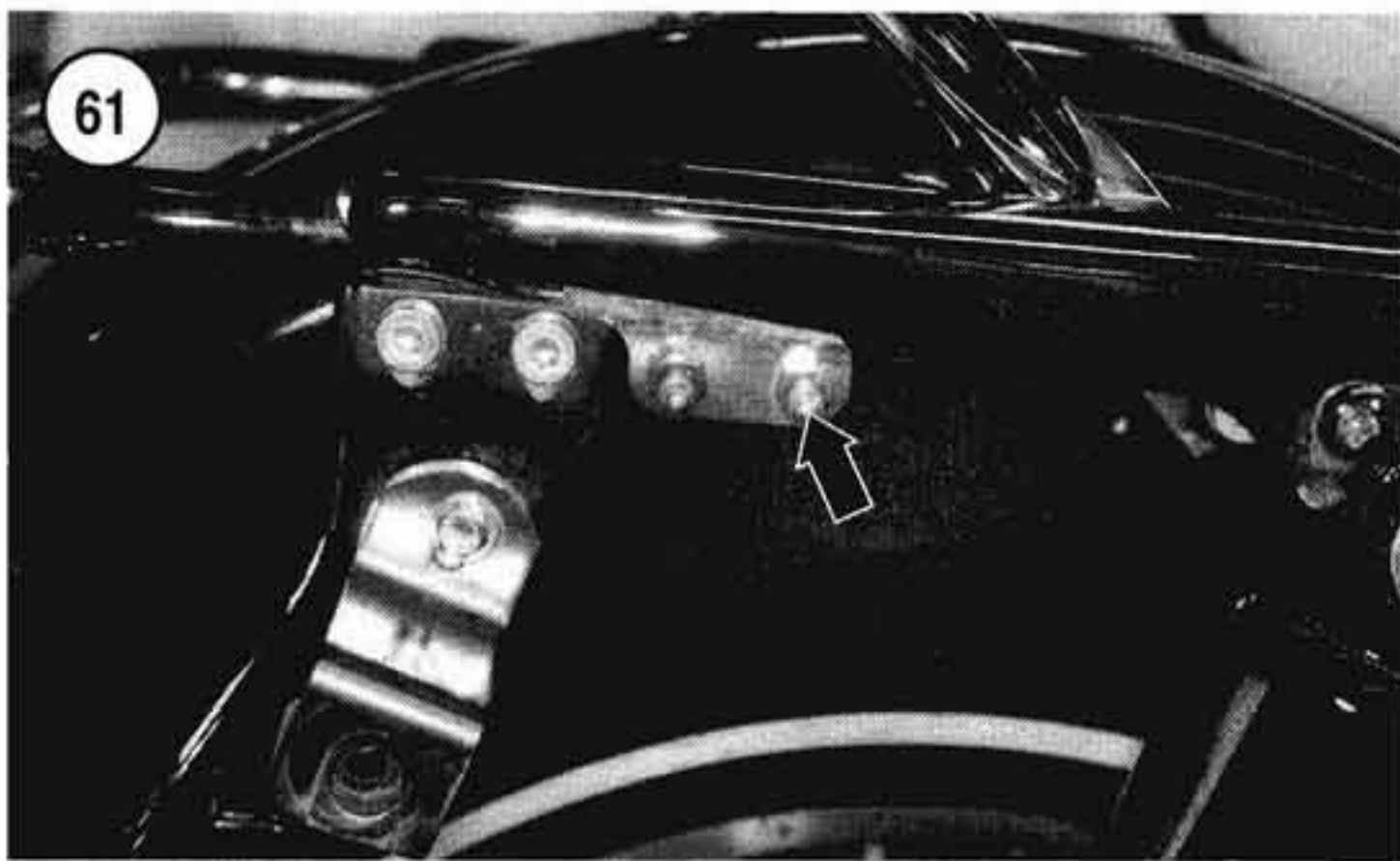
7. Install the air valve cap(s) and the saddlebag.

##### All models except 1996-1998 FLH and FLT series

#### WARNING

*Use caution when releasing the air from the front fork and the front fork air valve. Moisture and/or fork oil might spurt out when the air pressure is released. Protect eyes accordingly.*

1. Place the motorcycle on the jiffy stand.
- 2A. On 1984-1987 models, remove the front air valve cap (**Figure 62**).
- 2B. On 1988-1995 models, remove the front air valve cap (**Figure 63**).
3. Use a no-loss air gauge to check air pressure. Refer to the recommended air pressure listed in **Table 3** or **Table 4**.



4. Increase or decrease air pressure to achieve the desired ride and control.

5. Install the air valve cap.

### System Inspection

*All models except 1996-1998 FLH and FLT series*

Refer to **Figures 64-66**.

1. Check the tightness of the valve core within the air valve. If the valve core is tight, fill the system once again

and put some soapy water on the valve. If air bubbles appear across the face of the valve, the valve might be damaged. If air is not leaking from the valve core, securely tighten all of the air line fittings and recheck.

2. Visually inspect the air lines for cracks or other signs of damage. If tightening the fittings does not stop the leak, remove the assembly and replace worn or damaged parts.

3. On FLH and FLT series models, perform the following:
  - a. Check the ground connector screwed onto the air manifold. If the screws are loose, air can leak out of the screw hole.
  - b. If the screws are loose or suspect, remove them from the ground connector and apply Loctite Pipe Sealant with Teflon to the screw threads. Reinstall the screws and tighten securely.
  - c. Check the system once again for leaks.

### NOTE

*When removing the air control system as described in this chapter, you should replace all of the O-rings and copper washers (if used) during assembly.*

4. Check the antilock solenoid operation as follows:
  - a. Turn the ignition switch on.
  - b. Apply the front or rear brake while listening to the antilock solenoid. When the brake is applied, a faint click should be heard, or a vibration can be felt on the solenoid.
5. Check the antilock system as follows:
  - a. Install a no-loss air gauge on the air control valve fitting. See **Figure 62** and **Figure 63**.
  - b. Turn the ignition switch off.
  - c. Apply the front brake and bounce the front end while watching the air gauge. The air pressure should fluctuate as the front end moves up and down.
  - d. Turn the ignition switch on and repeat substep b. The air pressure should stay constant as the front wheel bounces up and down.
6. If necessary, service the air control/antilock system as described in this chapter.

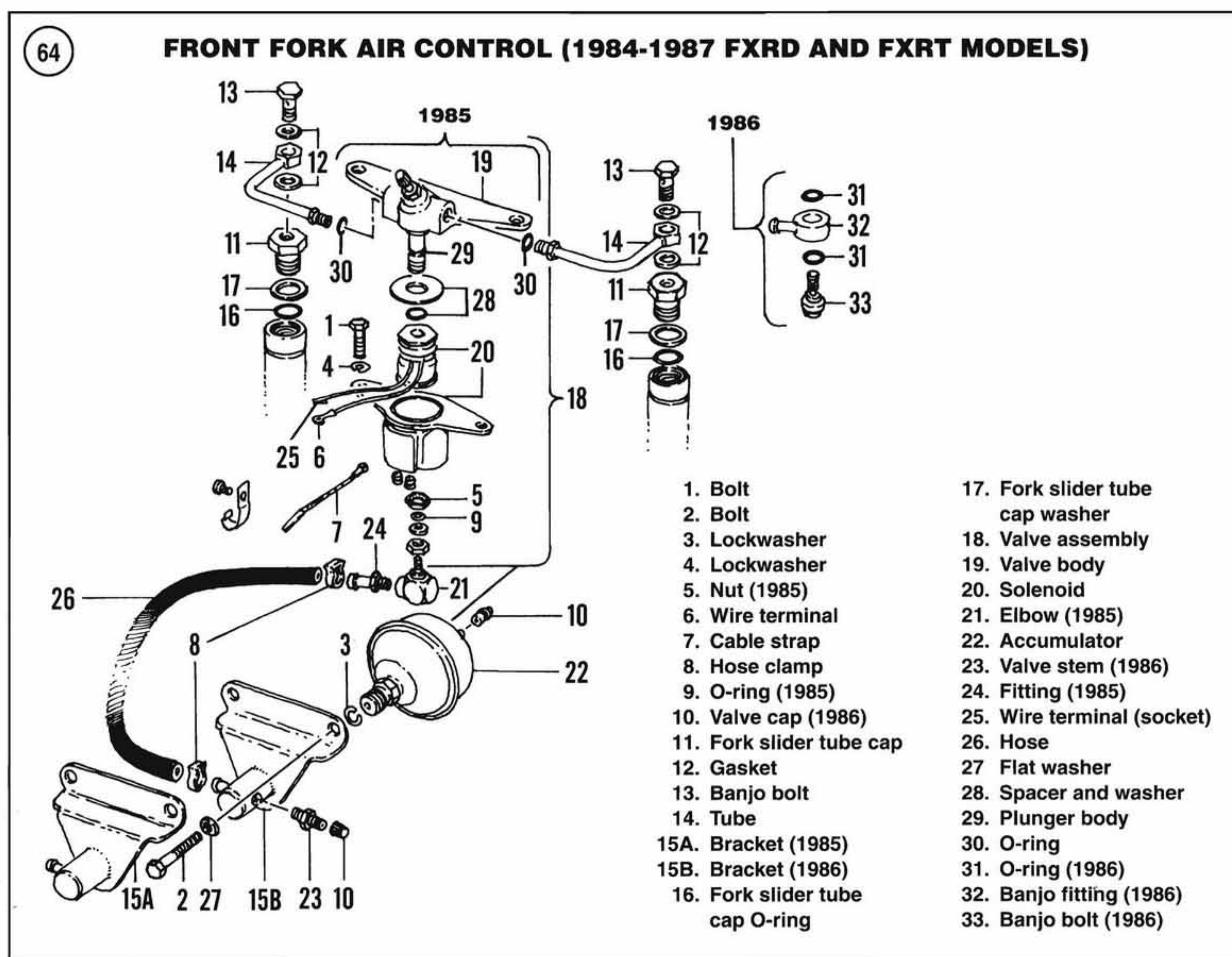
## FRONT FORK AIR CONTROL AND ANTIDIVE SYSTEM (SERVICE AND TESTING)

### Removal/Installation

*1984-1987 FXRD and FXRT models*

Refer to **Figure 64**.

1. Disconnect the negative battery cable from the battery.



2. Remove the air valve cap, depress the air valve and bleed the system.

3. Remove the instrument from the handlebar as described in Chapter Nine.

4. Remove both banjo bolts and the washers securing the air tubes to the fork cap.

5. Remove the antidive valve solenoid housing bolts and washers.

6. Disconnect the antidive valve electrical connectors.

7. Remove the accumulator bracket bolts and washers.

8. Remove the plastic tie(s) and clamp(s) securing the air hose to the fork tube.

9. Remove any additional plastic ties securing the control assembly.

10. Remove the air control assembly from the front fork.

11. Installation is the reverse of these steps while noting the following:

- a. If removed, install the air tubes to the valve body as described in this chapter.

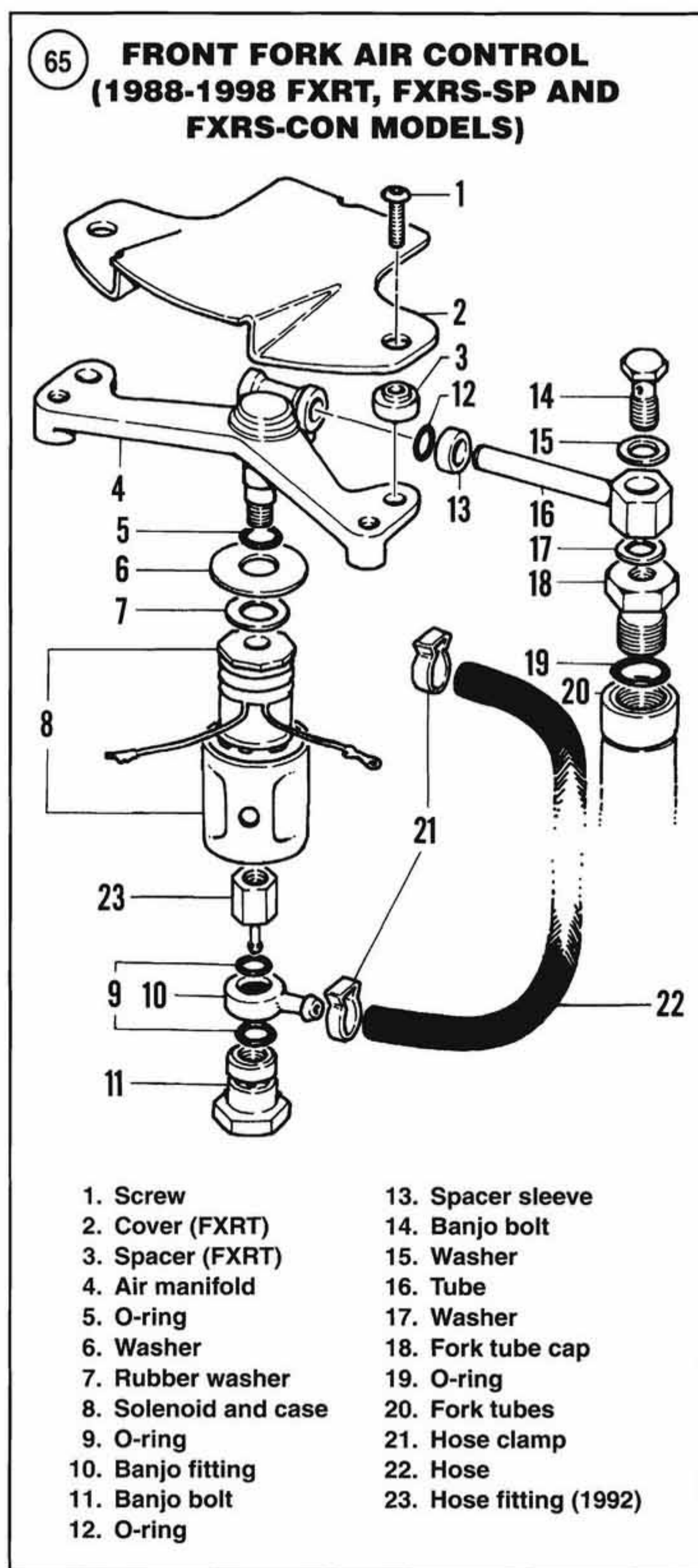
- b. Install the banjo bolts through the air tubes. Make sure to place a washer on both sides of the air tube(s) as shown in **Figure 64**. Tighten the banjo bolts to 25-30 ft.-lb. (34-41 N•m).

- c. Install the accumulator mounting bracket and the bolts. Place a flat washer so it is positioned between the bolt head and the bracket. Place a lockwasher so that it is positioned between the back of the bracket and the lower fork bracket. Tighten these bolts to 30-35 ft.-lb. (41-47 N•m).

- d. Slide a lockwasher onto the antidive solenoid housing mounting bolts and tighten the bolts to 155-190 in.-lb. (17-21 N•m).

- e. Reconnect the air hose. Make sure to secure both ends of the hose with *new* hose clamps.

- f. Pressurize the system as described in this chapter and check for leaks.



### 1988-1994 FXRT and FXRS-SP models

Refer to **Figure 65**.

1. Disconnect the negative battery cable as described in Chapter Nine.
2. Remove the air valve cap from the air valve in the left grip. Depress the air valve and bleed the system.

3. Remove the headlight as described in Chapter Nine.
4. On FXRT models, remove the screws securing the cover. Remove the cover and the two spacers.
5. On FXRS-SP models, remove the headlight bracket and the manifold bolts.
6. Remove the banjo bolts and washers securing the air tubes to the fork caps.
7. Disconnect the air hose at the antitive valve connection.
8. Remove the air control assembly from the front fork.
9. Installation is the reverse of these steps while noting the following:
  - a. Position the air fork assembly into position on the fork tubes.
  - b. Install a *new* O-ring into the valve body/air tube bore.
  - c. Insert the flared end of the air tube into the valve body; align the end of the tube with the fork cap. Secure the end of the tube with the O-ring and valve body.
  - d. Tighten the flare nut to 17 ft.-lb. (23 N•m).
  - e. Install the banjo bolts through the air tubes. Make sure to place a washer on both sides of the air tube(s) as shown in **Figure 65**. Tighten the banjo bolts to 25-30 ft.-lb. (34-41 N•m).
  - f. Reconnect the air hose. Secure both ends of the hose with *new* hose clamps.
  - g. On FXRT models, install the spacers under the top cover and tighten the screws securely.
  - h. Pressurize the system as described in this chapter and check for leaks.
  - i. Adjust the headlight as described in Chapter Nine.

### All 1984-1996 FLH and FLT series models except 1984-1996 FLHT and FLHTC

Refer to **Figure 66**.

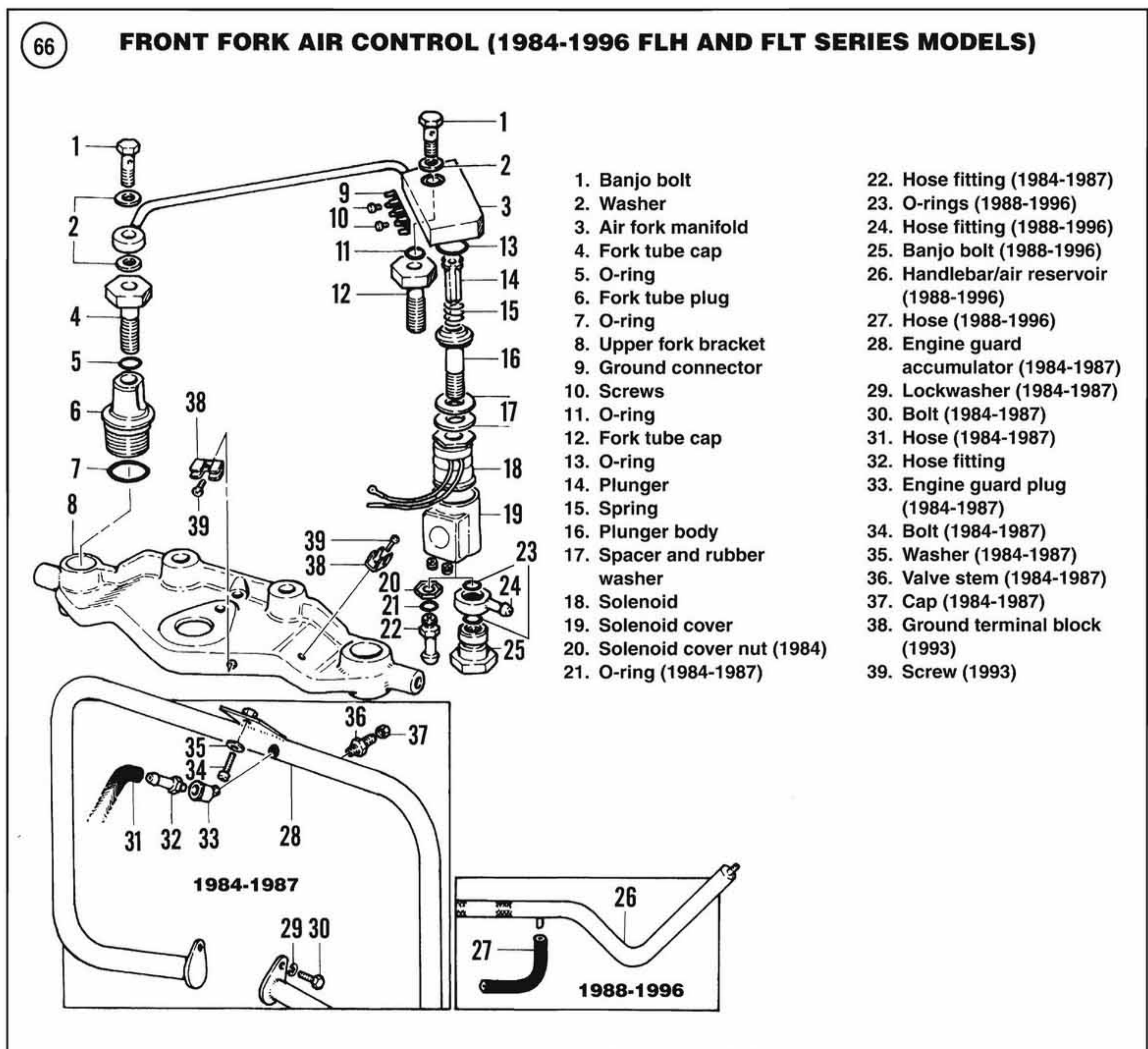
1. Disconnect the negative battery cable as described in Chapter Nine.

#### CAUTION

*When removing the instrument panel in Step 2, do not turn the panel upside down because damping oil in the fuel gauge will run onto the gauge face and stain it.*

#### NOTE

*Cover the fuel tank and front fender with a heavy cloth to protect them from accidental scratches or dents when removing the following components.*



2. Remove the instrument panel as described in Chapter Nine.

3. Remove the air valve cap. Then depress the air valve and bleed the system.

4A. On 1984-1987 models, disconnect the air hose from the engine guard accumulator.

4B. On 1988-1998 models, perform the following:

- Remove the handlebar riser locknuts from under the fork bracket.
- Remove the upper clamps and lift the handlebar up slightly.
- Disconnect the air hose from the fitting on the handlebar.

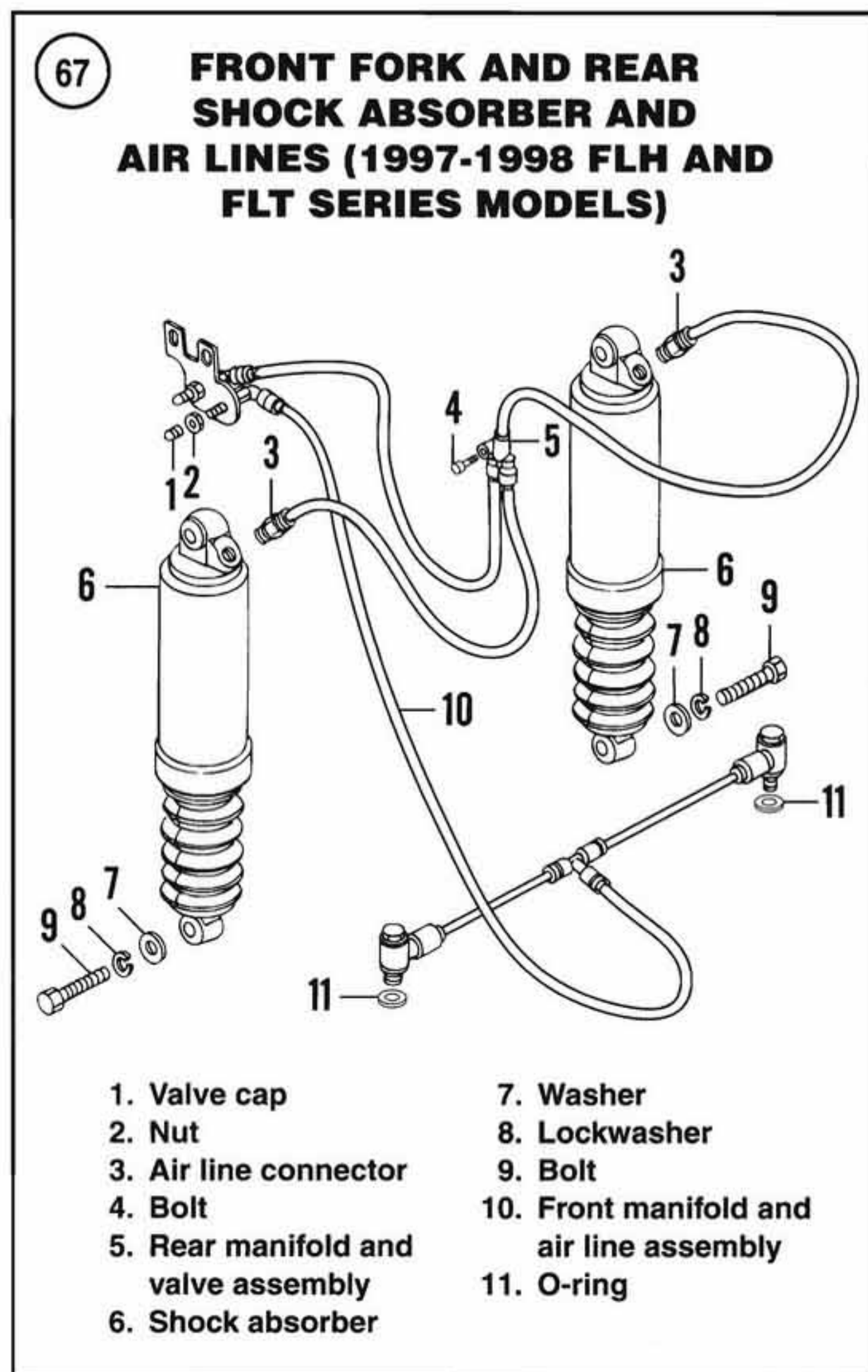
d. Set the handlebar aside to prevent damaging the control cables.

5. Loosen and remove the air manifold banjo bolts and washers. Disconnect any electrical connectors at the manifold and remove the manifold. Remove and discard the O-rings.

6. If necessary, remove the antidive switch as described in this section.

7. Installation is the reverse of these steps while noting the following:

- Install a *new* O-ring in the bottom of the air manifold.



- Position the antidive switch on the forks, if removed, and reconnect the switch electrical leads.
- Install the upper banjo bolts using new washers. Tighten banjo bolts to 25-30 ft.-lb. (34-41 N•m).
- Reconnect the air hoses after installing all air control components.
- Pressurize the system and check for leaks.

#### 1986-1996 FLHT and FLHTC models

Refer to **Figure 66**.

- Disconnect the negative battery cable as described in Chapter Nine.

#### NOTE

Cover the fuel tank and front fender with a heavy cloth to protect them from accidental scratches or dents when removing the following components.

- Remove the passing lamp bracket bolts and remove the bracket from the inner fairing; place the bracket onto the front fender. Reinstall the lower bracket bolts into the inner fairing to hold it in place.
- Remove the outer fairing as described in Chapter Fifteen.
- Remove the air valve cap. Then depress the air valve and bleed the system.
- If necessary, remove the valve as described under *Inspection* in this chapter.
- On 1988 or later models, disconnect the air hose from the fitting on the handlebar.
- Remove the handlebar riser nuts and move the handlebar back and lay it on the blanket covering the fuel tank.
- Remove the ignition/fork lock assembly mounting bolts on the upper fork bracket.
- If not already removed, disconnect the electrical connectors from the antidive valve.
- On 1986-1987 models, disconnect the hose from the antidive valve.
- Loosen and remove the two banjo bolts securing the air fork manifold to the fork tube bolts.
- Lift the air fork manifold up and remove it. If the manifold contacts the inner fairing, gently push the fairing back by hand to make room for the manifold.
- Installation is the reverse of these steps while noting the following:
  - Install a *new* O-ring in the bottom of the air manifold.
  - Position the antidive switch on the forks, if removed, and reconnect the switch electrical leads.
  - Install the upper banjo bolts using new washers. Tighten banjo bolts to 25-30 ft.-lb. (34-41 N•m).
  - Reconnect the air hoses after installing all air control components.
  - Pressurize the system and check for leaks.

#### 1997-1998 FLH and FLT series models

Refer to **Figure 67**.

- On all FLHT series models, remove the outer faring. On FLHTC series models, also remove the storage box. Refer to Chapter Fifteen.
- On all FLHR series models, remove the headlight nacelle as described in Chapter Nine.
- Remove the passing lamp assembly as described in Chapter Nine.
- Support the motorcycle with the front wheel off the ground. Refer to *Motorcycle Stands* in Chapter Ten.
- Remove the front fender and front wheel as described in Chapter Nine.

5. On models so equipped, remove the right saddlebag as described in Chapter Fifteen.

#### WARNING

*Use caution when releasing the air from the front fork air valve. Moisture and fork oil might spurt out when the air pressure is released. Protect eyes accordingly.*

6. Cover the rear brake assembly and wheel prior to releasing the compressed air from the rear air valve. If necessary, wipe any oil residue that may have been ejected from the air valve.

7. Remove the cap from the front fork air valve (A, **Figure 68**). Then slowly depress the air valve to evacuate the air from the front fork air pipe system. Unscrew and remove the core from the air valve. Place the air valve core and cap in a reclosable plastic bag to avoid misplacing them.

8. Refer to **Figure 69**. Unscrew and remove the hex bolts (**Figure 70**) securing the banjo bolt on top of each fork tube. Move the air tube assembly out of the way of the fork assemblies.

9. Remove the nut securing the air valve, hose and valve mounting bracket (B, **Figure 68**) on the frame.

10. Make a sketch of the front hose routing through the frame prior to removal. Then remove the hose assembly.

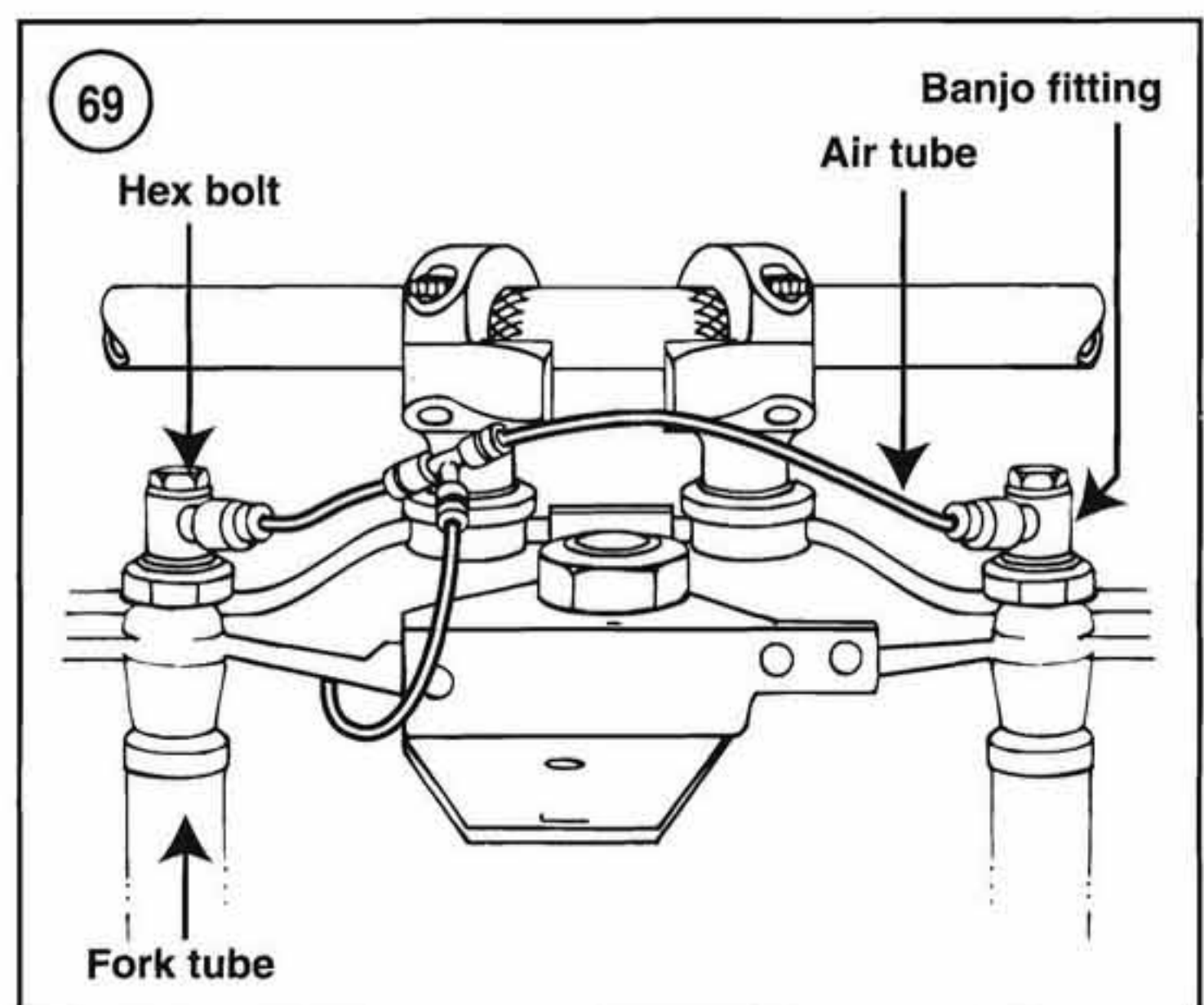
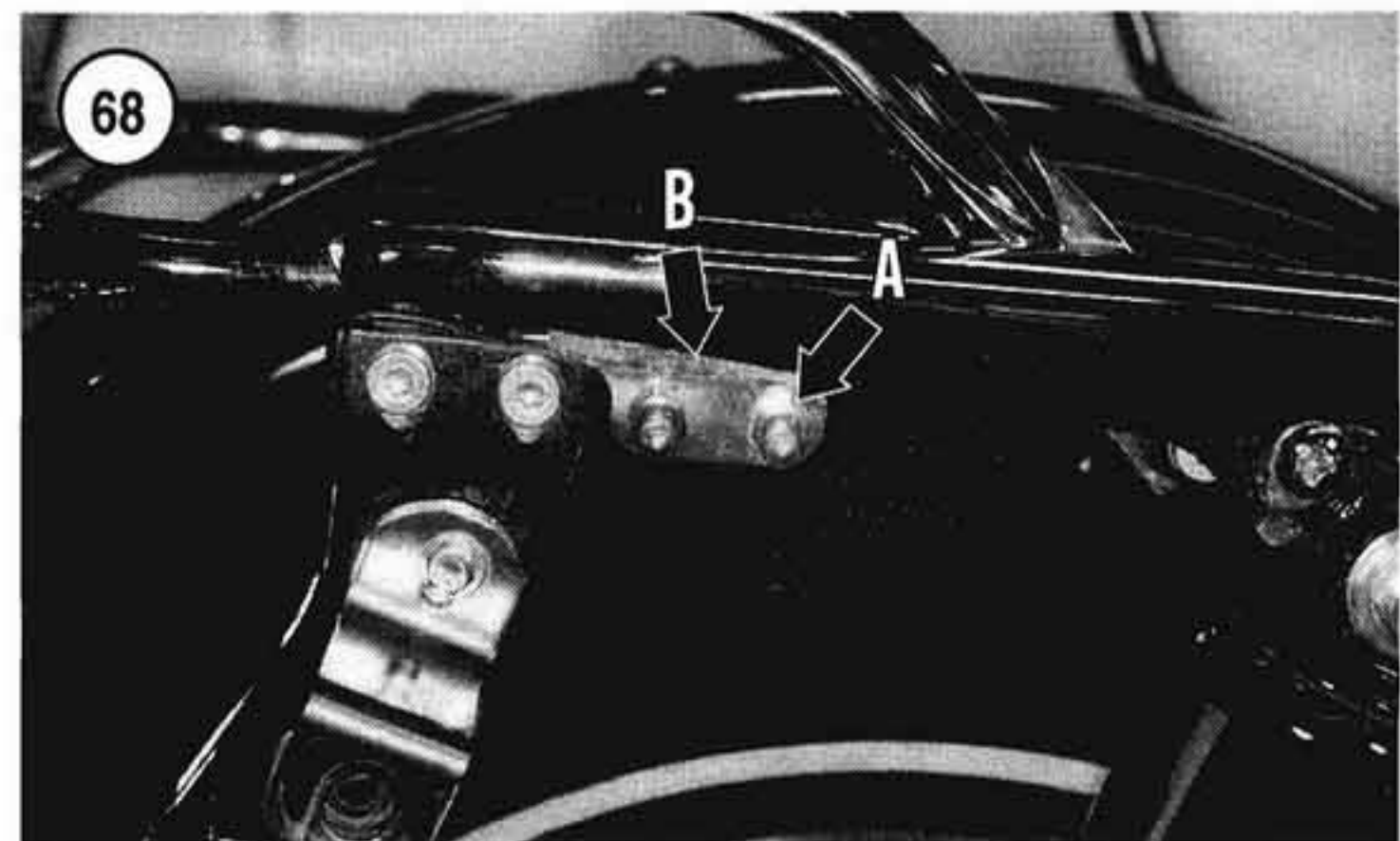
11. Installation is the reverse of these steps while noting the following:

- Install a *new* O-ring (**Figure 71**) and apply a light coat of oil to it.
- Install the air tube assembly onto the top of the fork assembly and install the hex bolts through the banjo bolts. Tighten the hex bolts to 97-142 in.-lb. (11-16 N•m).
- Pressurize the system and check for leaks.

### Antidive Solenoid Testing

Refer to **Figures 64-66**.

- Disconnect the switch leads.
- Connect the ohmmeter leads to both switch leads. The specified resistance is 10-20 ohms.
- Connect one ohmmeter lead to one of the antidive solenoid leads. Touch the other lead to the antidive solenoid housing. The resistance should be infinity.
- Replace the antidive solenoid if it failed either test.

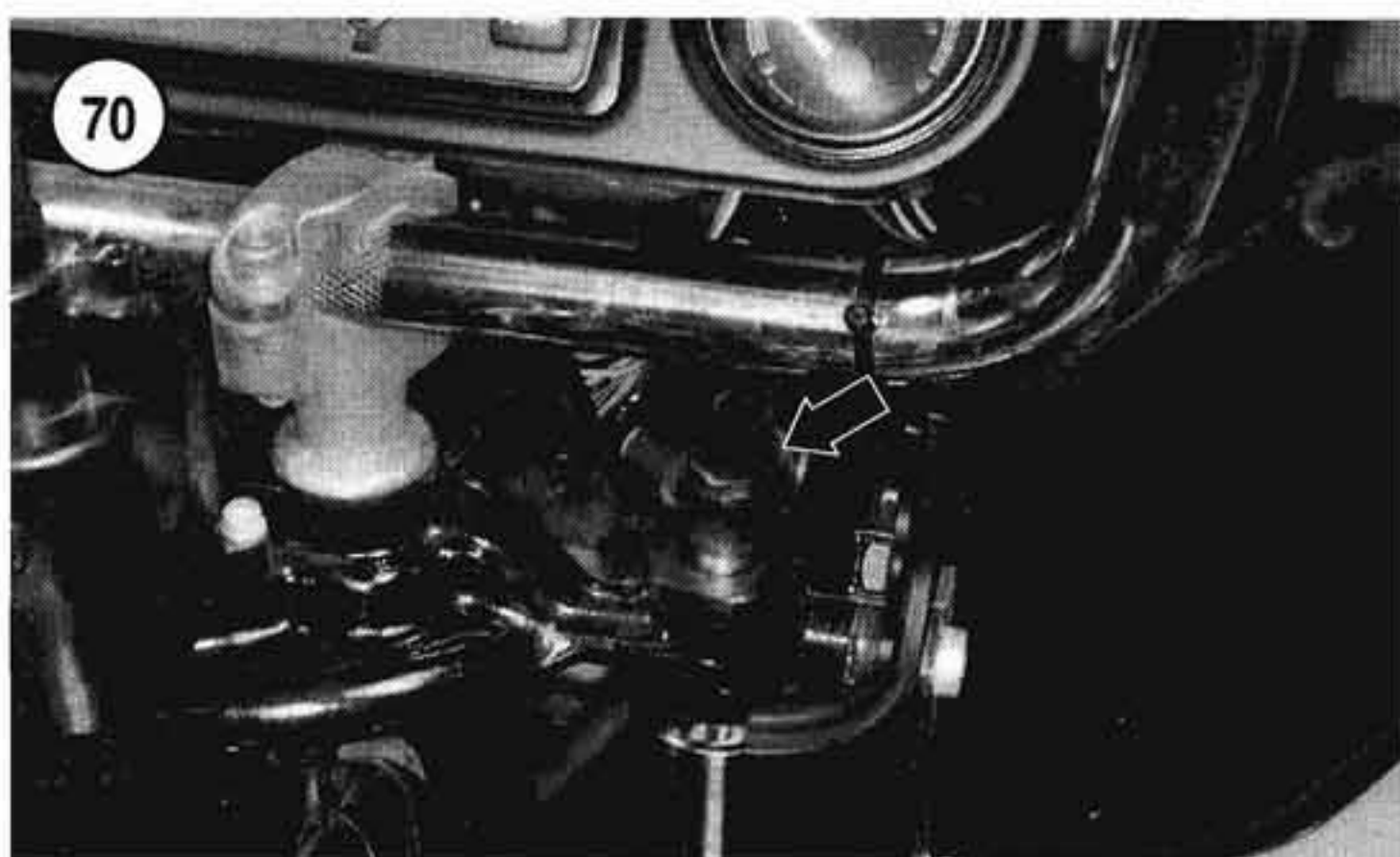


### Antidive Solenoid Removal/Installation

#### 1984-1987 FXRT and FXRD models

Refer to **Figure 64**.

- Remove the front fork air control assembly as described in this chapter.
  - On 1984-1985 models, disconnect the hose from the hose fitting. Then unscrew and remove the hose fitting, nut, washer and O-ring.
  - On 1986-1987 models, disconnect the hose from the banjo fitting. Then unscrew and remove the banjo bolt, banjo fitting and O-rings.
- On early models only, remove the nut from the end of the plunger body.
- Remove the antidive valve and its housing, O-ring and spacer.
- Unscrew the air hoses from the valve body. Remove the hoses and the O-rings. Discard the O-rings.
- Remove the plunger body from the antidive valve as follows:



- a. On 1984 models, use a spanner wrench and unscrew the plunger body from the antitive valve. If a spanner wrench is not available, thread two thin jam nuts onto the plunger body and lock them together.
  - b. On 1985 and later models, use a screwdriver and unscrew and remove the plunger body.
7. After removing the plunger body, remove the spring, plunger and O-ring from the plunger body.
  8. To ensure an air-tight system, replace all steel and copper washers and O-rings.
  9. Remove all sealer residue from the plunger body and antitive valve threads.
  10. Install a *new* O-ring into the air manifold recess.
  11. Position the smaller outer diameter of the plunger spring going in first and install the spring onto the plunger.
  12. Coat the plunger body threads with Loctite Pipe Sealant with Teflon and thread the plunger body into the air manifold. Tighten the plunger body using the same tool and method used for removal. See Step 6.
  13. Install the spacer, washer, antitive valve and valve housing.
  14. On early models only, install the nut onto the end of the plunger body.
  - 15A. On 1984-1985 models, perform the following:

- a. Install the nut, washer and O-ring onto the hose fitting.
  - b. Thread the hose fitting into the end of the plunger body.
  - c. Securely tighten the nut, washer and O-ring.
- 15B. On 1986-1987 models, perform the following:
    - a. Install two *new* O-rings into the banjo fitting grooves.
    - b. Then slide the banjo fitting over the plunger body.
    - c. Install the banjo bolt and tighten to 97-124 in.-lb. (11-14 N•m).

#### **1988-1998 FXRT, FXRS-SP and FXRS-Con models**

Refer to **Figure 65**.

1. Remove the front fork air control assembly as described in this chapter.
- 2A. On 1988-1991 models, loosen and remove the banjo bolts, banjo fitting and two O-rings.
- 2B. On 1992-1998 models, loosen and remove the fitting and O-ring.
3. Remove the antitive solenoid and its housing, rubber washer, washer and O-ring.
4. On 1984 models, use a spanner wrench and unscrew the plunger body from the antitive valve. If a spanner wrench is not available, thread two thin jam nuts onto the plunger body and lock them together.
5. Thread two thin jam nuts onto the plunger body and lock them together. Unscrew and remove the plunger body from the bottom of the air manifold.
6. Remove the spring, plunger and O-ring from the plunger body.
7. If necessary, remove the two tubes from the top of the air manifold.

#### **CAUTION**

*When removing the tube(s) in Step 8, do not remove the spacer sleeves.*

8. Carefully pull and remove the air tube from the air manifold. Remove the O-ring installed between the tube and air manifold seat. Repeat for the other air tube and O-ring.
9. Remove all sealer residue from the plunger body and antitive valve threads.
10. Install a *new* O-ring into the air manifold recess.
11. Position the smaller outer diameter of the plunger spring going in first and install the spring onto the plunger.

12. Coat the plunger body threads with Loctite Pipe Sealant with Teflon and thread the plunger body into the air manifold. Securely tighten the plunger body.
13. Slide the washer, rubber washer and antidive solenoid onto the plunger body. Install the housing onto the antidive solenoid.
14. Install a *new* O-ring into the groove above the threads on the plunger body.
- 15A. On 1988-1991 models, perform the following:
  - a. Install two *new* O-rings into the banjo fitting and slide the banjo fitting onto the plunger body. Thread the banjo bolt onto the plunger body until it is finger-tight.
  - b. Turn the banjo fitting so that its hose nozzle faces in the direction shown in **Figure 65**. Tighten the banjo bolt to 97-124 in.-lb. (11-14 N•m).
- 15B. On 1992-1998 models, install the fitting with a *new* O-ring.
16. If the air tubes were removed, install them as follows:
  - a. Install a *new* O-ring into the air manifold.
  - b. Carefully insert the air tube into the air manifold until the taper on the end of the tube touches the O-ring.
  - c. Repeat for the other tube and O-ring.

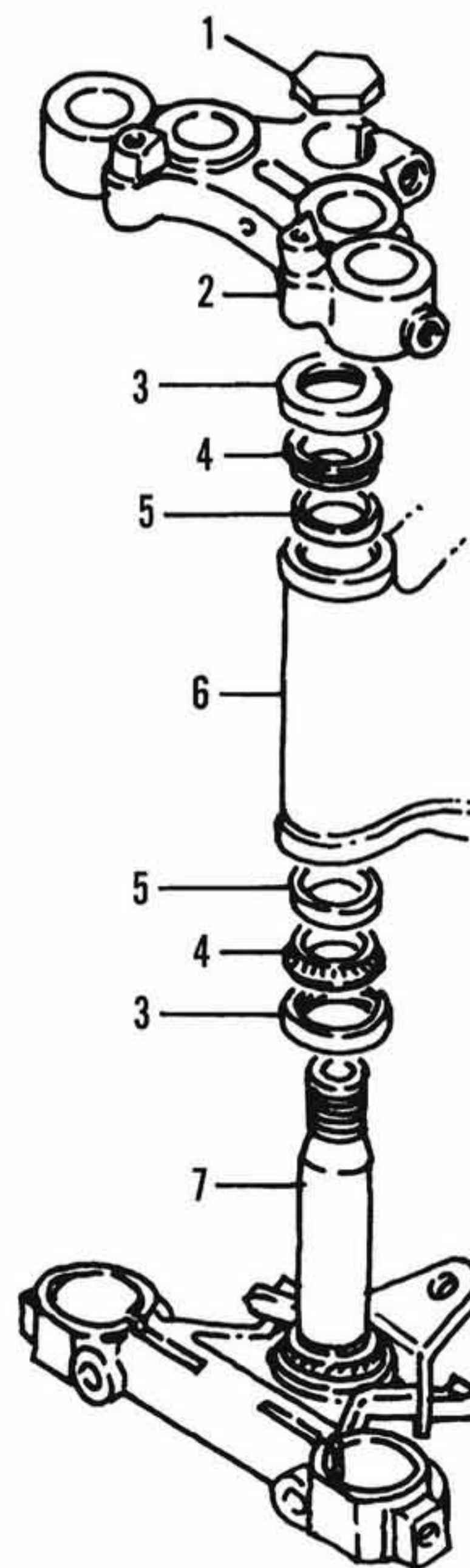
### FLH and FLT series models

Refer to **Figure 66**.

- 1A. On FLT, 1984-1985 FLHTC and FLHS models, perform Steps 1-7 under *Removal* (All 1984-1996 FLH and FLT series models except 1984-1996 FLHT and FLHTC) in this section.
- 1B. On 1986-1996 FLHTC models, perform Steps 1-7 under *Removal* (1986-1996 FLHT and FLHTC models) in this section.
- 2A. On 1984-1987 models, remove the hose fitting and O-ring from the bottom of the antidive solenoid.
- 2B. On 1988-1996 models, remove the banjo bolt, O-rings and hose fitting from the bottom of the antidive solenoid.
3. If so equipped, remove the antidive valve cover nut.
4. Remove the antidive valve case, antidive valve, spacer and rubber washer.
5. To remove the plunger body from the antidive valve as follows:
  - a. On 1984 models, use a spanner wrench and unscrew the plunger body from the antidive valve. If a spanner wrench is not available, thread two thin jam nuts onto the plunger body and lock them together.
  - b. On 1985 and later models, use a screwdriver and unscrew and remove the plunger body.

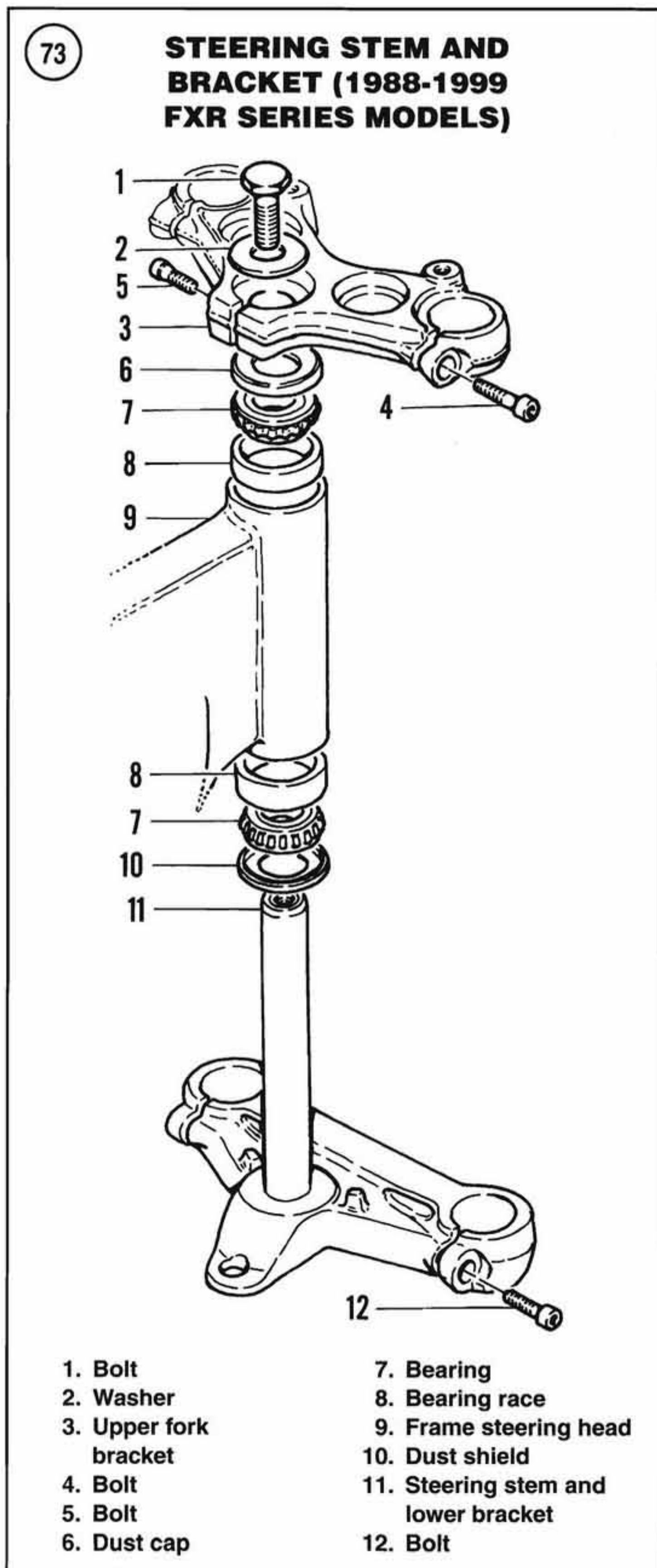
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### STEERING STEM AND BRACKET (1984-1987 FXR SERIES MODELS)



- |                      |                                    |
|----------------------|------------------------------------|
| 1. Steering stem nut | 5. Bearing race                    |
| 2. Upper bracket     | 6. Frame steering head             |
| 3. Dust shield       | 7. Steering stem and lower bracket |
| 4. Bearing           |                                    |

6. After removing the plunger body, remove the spring, plunger and O-ring from the plunger body.
7. To ensure an air-tight system, install all *new* steel and copper washers and O-rings.
8. Remove all sealer residue from the plunger body and antidive valve threads.
9. Install a *new* O-ring into the air manifold recess.



10. Position the smaller outer diameter of the plunger spring going in first and install the spring and install the plunger.

11. Coat the plunger body threads with Loctite Pipe Sealant with Teflon and thread the plunger body into the air

manifold. Tighten the plunger body using the same tool and method used in *Removal* in Step 5.

12. Install the spacer, washer, antitive valve and valve housing. On early models only, install the nut onto the end of the plunger body and tighten securely.

13A. On 1984-1987 models, install a *new* O-ring into the groove machined above the plunger body threads. Then install the hose fitting on the plunger body.

13B. On 1986-1987 models, perform the following:

- Install two *new* O-rings into the banjo fitting grooves.
- Then slide the banjo fitting over the plunger body.
- Install the banjo bolt and tighten to 97-124 in.-lb. (11-14 N•m).

14. If the ground connector was removed from the air fork manifold, perform the following:

- Apply Loctite Pipe Sealant with Teflon to the screw threads before installing the screws.
- Move the ground connector into position and install the two screws. Tighten the screws securely to prevent an air leak.

## STEERING HEAD AND STEM

### FXR Series Models

#### Removal

Refer to **Figure 72** and **Figure 73**.

- Remove the front wheel as described in Chapter Ten.
- Remove the fuel tank as described in Chapter Nine.
- Remove the handlebar assembly as described in this chapter. Position the handlebar so that the control cables are not kinked or damaged.
- On models with the air control system, remove the air control system from the upper fork bracket as described in this chapter.
- Loosen the fork stem nut on early models or the steering stem bolt on later models.
- Remove the front forks as described in this chapter.

#### NOTE

*Hold onto the steering stem when removing the upper fork bracket pinch bolt in Step 7 to prevent the steering stem from falling out.*

7. Loosen the steering stem pinch bolt and remove the upper bracket.

8. Carefully lower the steering stem and lower bracket out of the steering head.

9. Remove the upper dust shield from the steering head.

10. Remove the bearing from the upper bearing race in the steering head.

11. Inspect the fork stem assembly as described in this section.

### Installation

1. Thoroughly pack both bearings with bearing grease.
2. Make sure the steering head and stem races are properly seated.
3. Apply a light coat of grease to the steering head races.
4. Install the lower dust shield onto the lower bearing on the steering stem.
5. Install the steering stem into the steering head and hold it firmly in place.
6. Install the upper bearing over the fork stem and seat into the upper race.
7. Install the upper dust shield.
8. Install the upper bracket onto the steering stem and tighten the steering stem pinch bolt securely.
9. Install the fork stem nut on early models or the steering stem bolt on later models. Tighten securely.
10. Install the front fork as described in this chapter.
11. Tighten the upper bracket-to-fork stem pinch bolt to the specification in **Table 5**.

### CAUTION

*Do not overtighten the fork stem nut or bolt in Step 12, or the bearings and races can be damaged.*

12. Tighten the fork stem nut or bolt to remove all noticeable play in the fork stem.
13. Install the handlebar assembly as described in this chapter.
14. Install the fuel tank as described in Chapter Nine.
15. Adjust the front steering as described in this chapter.
16. On models with the air control system, install the air control system onto the upper fork bracket as described in this chapter.

### FXWG Models

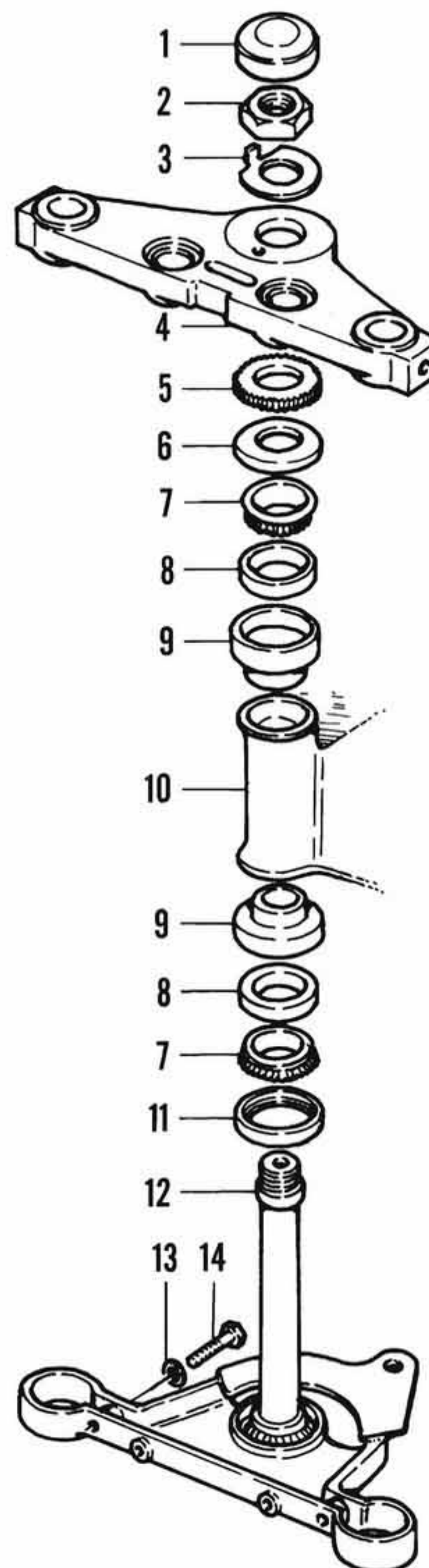
### Removal

Refer to **Figure 74**.

1. Remove the front wheel as described in Chapter Ten.
2. Remove the fuel tank as described in Chapter Nine.
3. Remove the handlebar assembly as described in this chapter. Position the handlebar so that the control cables are not kinked or damaged.
4. Remove the front fork as described in this chapter.
5. Remove the headlight and headlight bracket as described in Chapter Nine.

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### STEERING STEM AND BRACKET (FXWG MODELS)



- |                      |                                     |
|----------------------|-------------------------------------|
| 1. Cap               | 9. Bearing cup                      |
| 2. Steering stem nut | 10. Frame steering head             |
| 3. Lockwasher        | 11. Lower dust shield               |
| 4. Upper bracket     | 12. Steering stem and lower bracket |
| 5. Adjust nut        | 13. Washer                          |
| 6. Upper dust shield | 14. Bolt                            |
| 7. Bearing           |                                     |
| 8. Bearing race      |                                     |

6. Remove the brake hose bracket at the bottom of the fork stem bracket. Do not disconnect the brake hose connection.
7. Disconnect the ground wire at the fork stem bracket.
8. Remove the steering stem cap from the fork stem nut.
9. Straighten the lockwasher tab away from the steering stem nut. Then loosen and remove the nut and lockwasher.
10. Remove the upper steering stem bracket from the steering stem.

#### NOTE

*To prevent the steering stem from falling out, hold onto the steering stem when removing the upper fork bracket pinch bolt in Step 11.*

11. Loosen and remove the bearing adjust nut. Then slide the steering stem and bracket out of the steering head.
12. Remove the upper dust shield from the steering head.
13. Remove the bearing from the upper bearing race in the steering head.
14. Inspect the fork stem assembly as described in this section.

#### Installation

1. Thoroughly pack both bearings with bearing grease.
2. Make sure the steering head and stem races are properly seated.
3. Apply a light coat of grease to the steering head races.
4. Install the lower dust shield onto the lower bearing on the steering stem.
5. Install the steering stem into the steering head and hold it firmly in place.
6. Install the upper bearing over the steering stem and seat into the upper race.
7. Install the upper dust shield.
8. Install the bearing adjust nut and tighten to remove all bearing play.
9. Install the upper bracket over the steering stem.
10. Install a *new* lockwasher over the steering stem and insert the locating pin into the hole in the fork bracket.
11. Install the steering stem nut until it is finger-tight. Check that the lockwasher location pin is still engaged in the hole in the upper bracket.

#### NOTE

*Final tightening of the steering stem nut will occur after the front wheel is installed and the front steering is adjusted as described in this section.*

12. Install the brake hose bracket to the lower steering stem bracket and tighten to 133 in.-lb. (15 N•m).
13. Install the headlight bracket and headlight. Adjust the headlight as described in Chapter Nine.
14. Install the front fork as described in this chapter.
15. Install the front wheel as described in Chapter Ten.
16. Adjust the front steering as described in this chapter.
17. Install the fork stem cap over the nut.

#### FXSB and FXEF Models

##### Removal

Refer to **Figure 75**.

1. Remove the front wheel as described in Chapter Ten.
2. Remove the fuel tank as described in Chapter Nine.
3. Remove the handlebar assembly as described in this chapter. Position the handlebar so that the control cables are not kinked or damaged.
4. Remove the front fork as described in this chapter.
5. Remove the brake hose bracket at the bottom of the fork stem bracket. Do not disconnect the brake hose connection.

#### CAUTION

*Secure the steering stem before removing the fork stem nut in the following steps, or it will fall to the ground.*

6. Loosen and remove the steering stem nut.
7. Loosen the upper bracket pinch bolt.
8. Remove the upper bracket from the steering stem.
9. Lower the fork stem out of the steering head.
10. Remove the upper dust shield.
11. Remove the bearing from the upper bearing race in the steering head cup.
12. Inspect the fork stem assembly as described later in this chapter.

##### Installation

1. Thoroughly pack both bearings with bearing grease.
2. Make sure the steering head and stem races are properly seated.
3. Apply a light coat of grease to the steering head races.
4. Install the lower dust shield onto the lower bearing on the steering stem.
5. Install the steering stem into the steering head and hold it firmly in place.
6. Install the upper bearing over the steering stem and seat into the upper race.
7. Install the upper dust shield.

8. Install the upper bracket over the steering stem.
9. Install the steering stem nut until it is finger-tight.

**NOTE**

*Final tightening of the steering stem nut will occur after the front wheel is installed and the front steering is adjusted as described in this section.*

10. Install the front fork as described in this chapter.
11. Install the brake hose bracket at the bottom of the fork stem bracket.
12. Install the front wheel as described in Chapter Ten.
13. Adjust the front steering as described in this chapter.
14. Install the fork stem cap over the nut.

### FLH and FLT Series Models

#### Removal

Refer to **Figure 76**.

1. Remove the front wheel as described in Chapter Ten.
2. On 1986-1998 FLHTC series models, remove the light bar and outer fairing as described in Chapter Fifteen.
3. On FLTC series models, remove the instrument panel and handlebar.
4. Remove the fuel tank as described in Chapter Nine.
5. Remove the handlebar assembly as described in this chapter. Position the handlebar so that the control cables are not kinked or damaged.
6. On models with the air control system, remove the air control system from the upper fork bracket as described in this chapter.
7. Remove the front fork as described in this chapter.
8. Remove the brake line bracket at the lower fork stem bracket.
9. Disconnect the electrical connectors from the main circuit board.
10. On models so equipped, straighten the lockwasher tab away from the fork stem nut. Then loosen and remove the nut, lockwasher and main circuit board.
11. Remove the upper fork bracket from the steering stem.

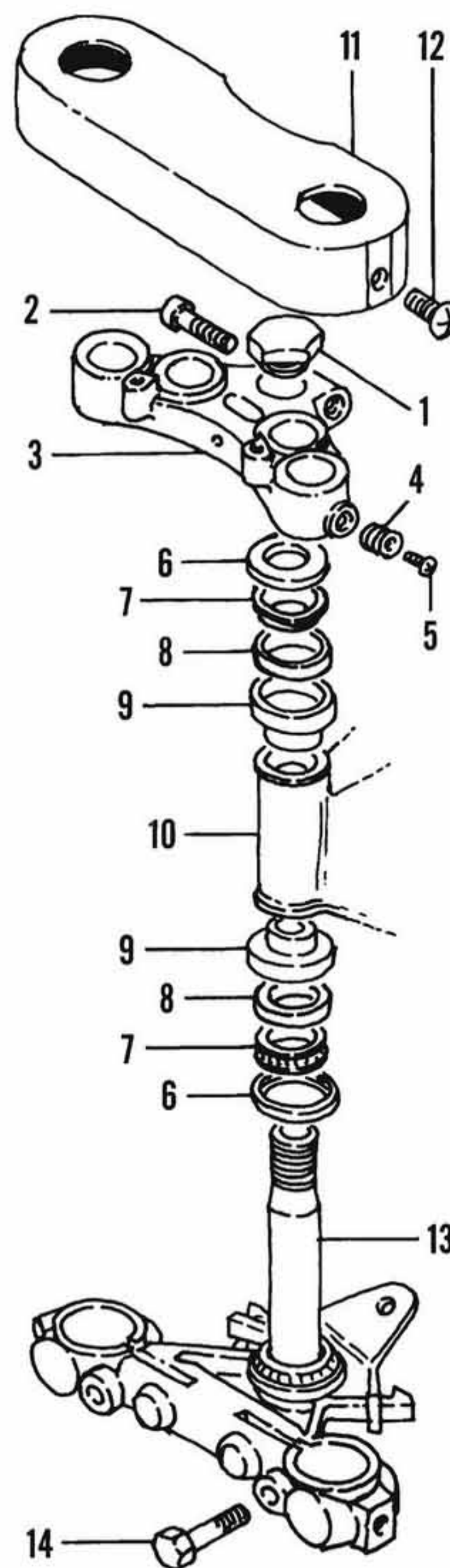
**NOTE**

*To prevent the steering stem from falling out, hold onto the steering stem when removing the upper fork bracket pinch bolt in Step 11.*

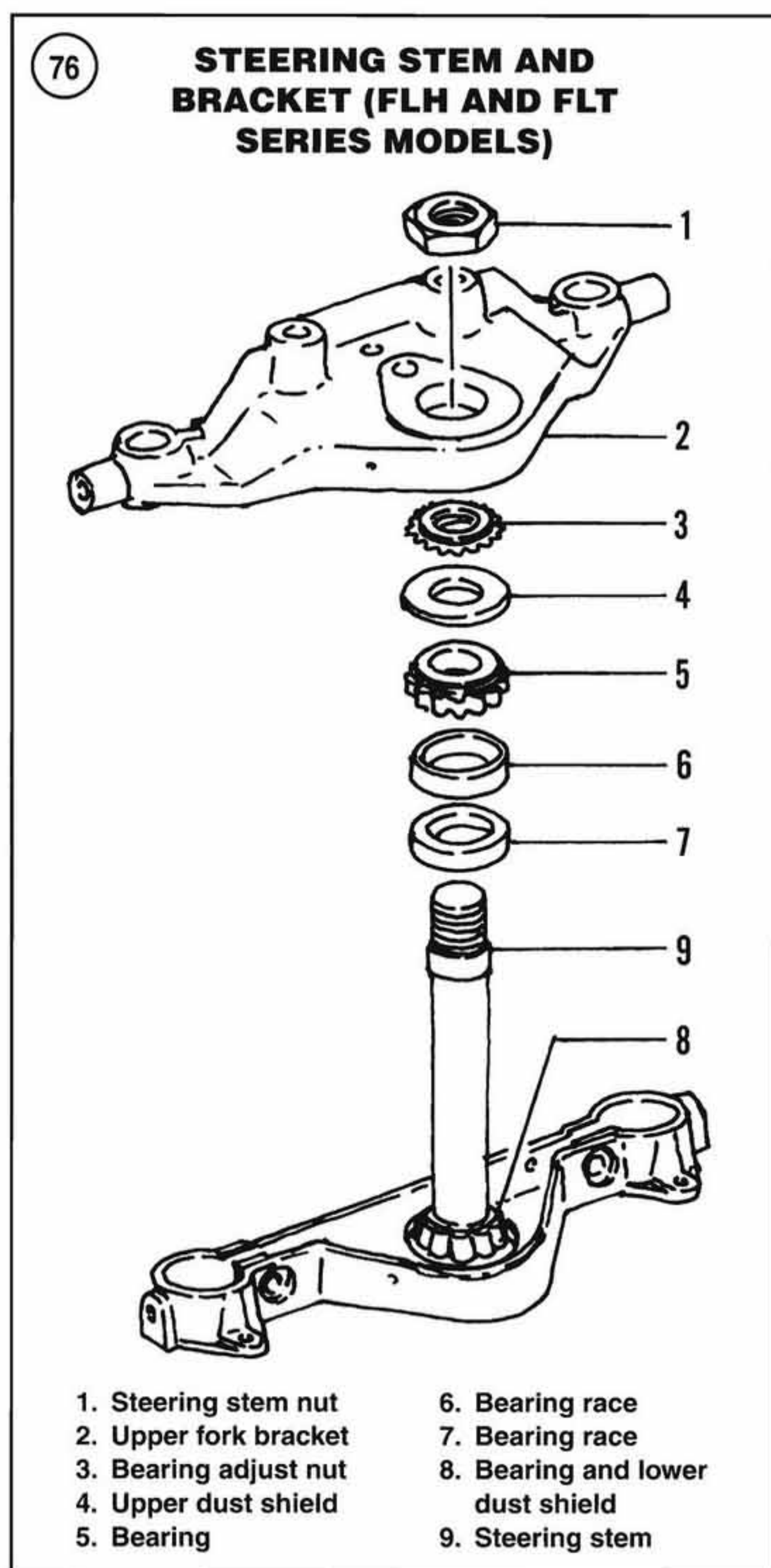
12. Loosen and remove the bearing adjust nut, then slide the steering stem and bracket out of the steering head.
13. Remove the upper dust shield from the steering head.

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### STEERING STEM AND BRACKET (FXSB AND FXEF MODELS)



- |                      |                                     |
|----------------------|-------------------------------------|
| 1. Steering stem nut | 9. Bearing cup                      |
| 2. Bolt              | 10. Frame steering head             |
| 3. Upper bracket     | 11. Cover                           |
| 4. Insert            | 12. Screw                           |
| 5. Screw             | 13. Steering stem and lower bracket |
| 6. Dust shield       | 14. Bolt                            |
| 7. Bearing           |                                     |
| 8. Bearing race      |                                     |



14. Remove the bearing from the upper bearing race in the steering head.

15. Inspect the steering stem assembly as described in this section.

### Installation

1. Thoroughly pack both bearings with bearing grease.
2. Make sure the steering head and stem races are properly seated.
3. Apply a light coat of grease to the steering head races.

4. Install the lower dust shield onto the lower bearing on the steering stem.

5. Install the steering stem into the steering head and hold it firmly in place.

6. Install the upper bearing over the steering stem and seat it into the upper race.

7. Install the upper dust shield.

8. Install the bearing adjust nut and tighten to remove all bearing play.

9. Install the upper bracket over the fork stem.

10. Install the main circuit board and align it with the mounting bracket.

### CAUTION

*Do not overtighten the fork stem nut in Step 11, or the bearings and races can be damaged.*

11. Install the steering stem nut and tighten it to 35-40 ft.-lb. (47-54 N•m).

12. On models so equipped, bend the lockwasher tab against one flat on the nut. If necessary, tighten the nut to align it with the lockwasher.

13. On 1991-1998 models, pack the steering head with the same type of bearing grease originally used to pack the bearing during disassembly.

14. Connect the electrical connectors from the main circuit board.

15. Install the brake line bracket onto the lower steering stem bracket.

16. Install the front fork as described in this chapter.

17. On models with the air control system, install the air control system from the upper fork bracket as described in this chapter.

18. Install the handlebar assembly as described in this chapter.

19. Install the fuel tank as described in Chapter Nine.

20. On FLTC series models, install the instrument panel and handlebar.

21. On 1986-1998 FLHTC series models, install the light bar and outer fairing as described in Chapter Fifteen.

22. Install the front wheel as described in Chapter Ten.

23. Adjust steering play as described in this chapter.

### Inspection (All Models)

The bearing outer races are pressed into the steering head. Do not remove them unless they are going to be replaced.

1. Wipe the bearing races with a solvent-soaked rag and dry them with compressed air or a lint-free cloth. Check the races in the steering head (**Figure 77**) for pitting,



scratches, galling or excessive wear. If any of these conditions exist, replace the races as described in this chapter. If the races are in good condition, wipe each race with grease.

2. Clean the bearings in solvent to remove all of the old grease. Blow the bearing dry with compressed air without allowing the air jet to spin the bearing. Do not remove the lower bearing from the fork stem unless it is to be replaced. Clean the bearing while it is installed in the steering stem.

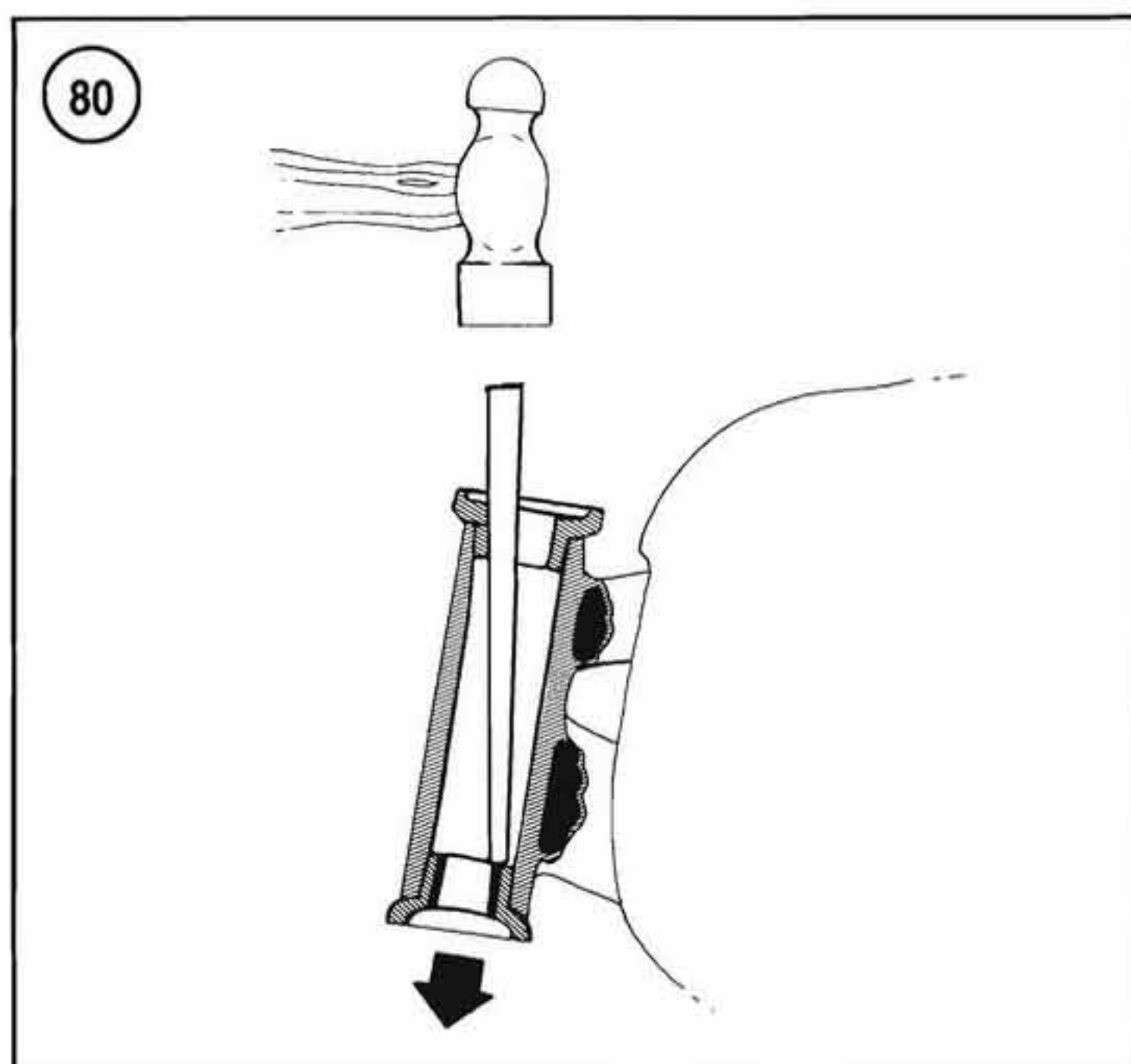
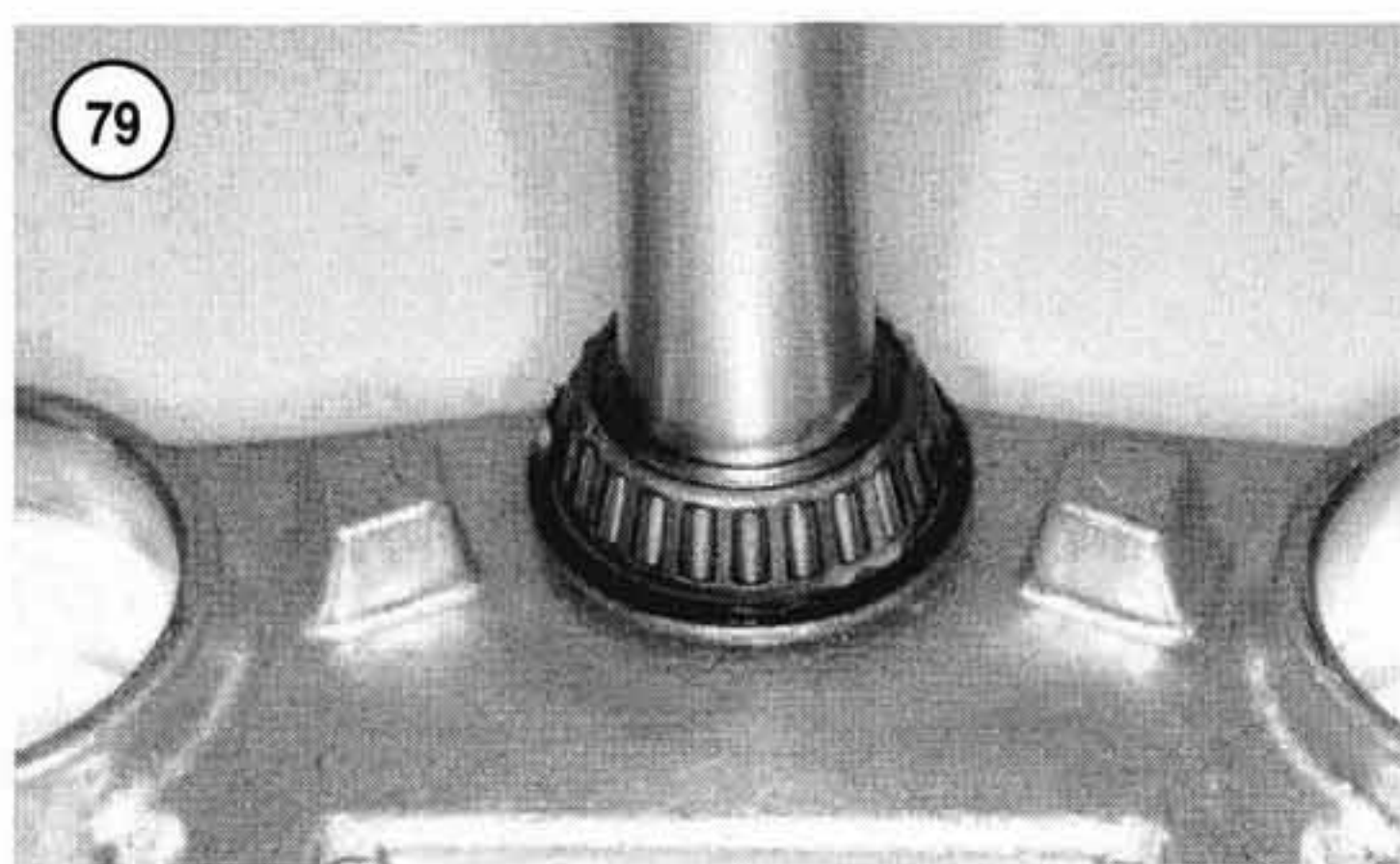
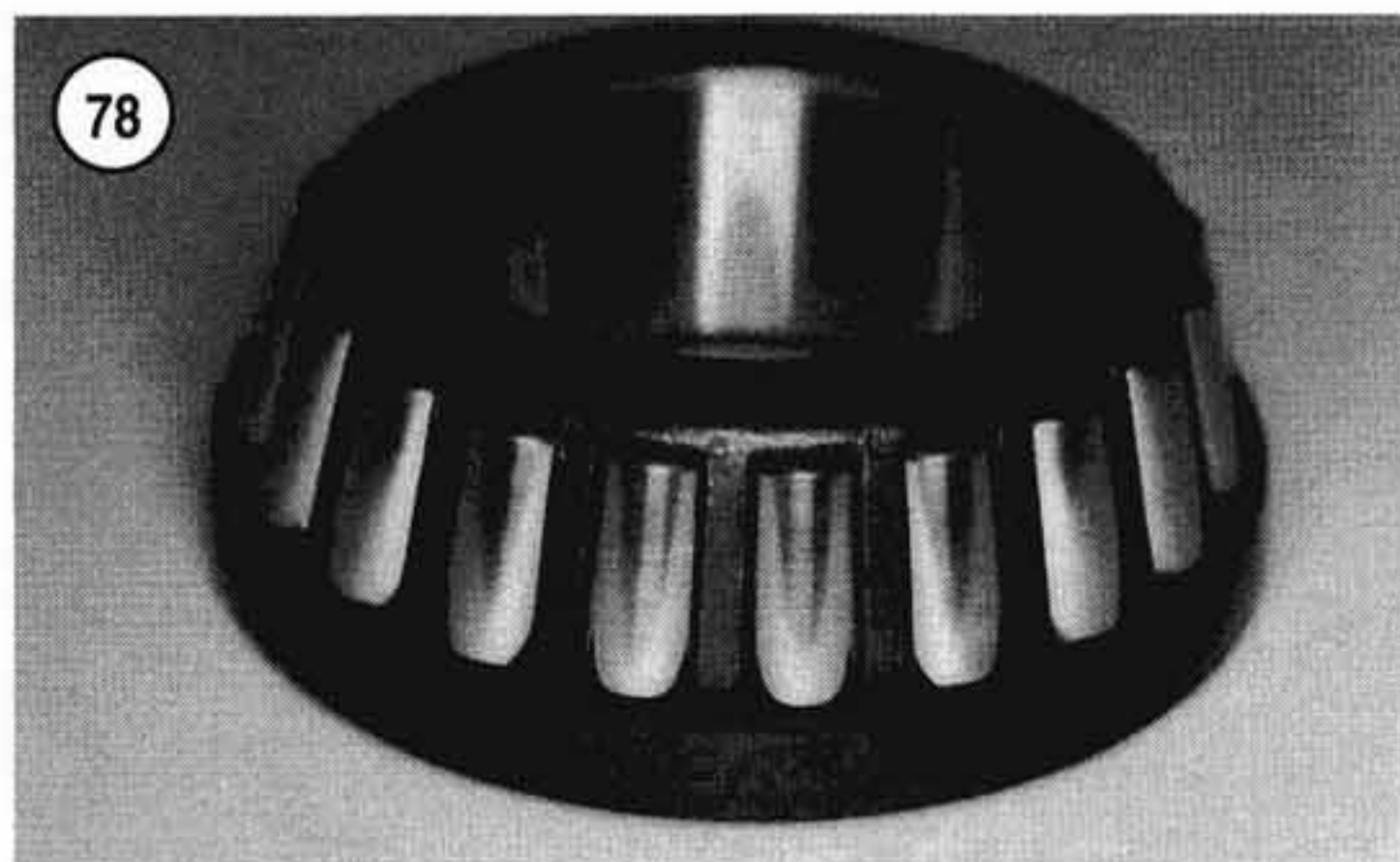
3. After the bearings are dry, hold the inner race with one hand and turn the outer race with the other hand. Turn the bearing slowly. The bearing should turn smoothly with no roughness. Visually check the bearing (**Figure 78**) for pitting, scratches or visible damage. If the bearings are worn, check the dust covers for wear, damage or improper bearing lubrication. Replace the bearing if necessary. If a bearing is going to be reused, pack it with grease and wrap it with wax paper or some other lint-free material until it is reinstalled. Do not store the bearings for any length of time without lubricating them to prevent rust.

4. Check the steering stem/lower bracket for cracks or damage. Check the threads at the top of the stem for damage. Check the steering stem bolt or nut for damage. Thread it into the steering stem. Make sure the bolt or nut threads easily with no roughness.

5. Replace all worn or damaged parts. Replace bearing races as described in this chapter.

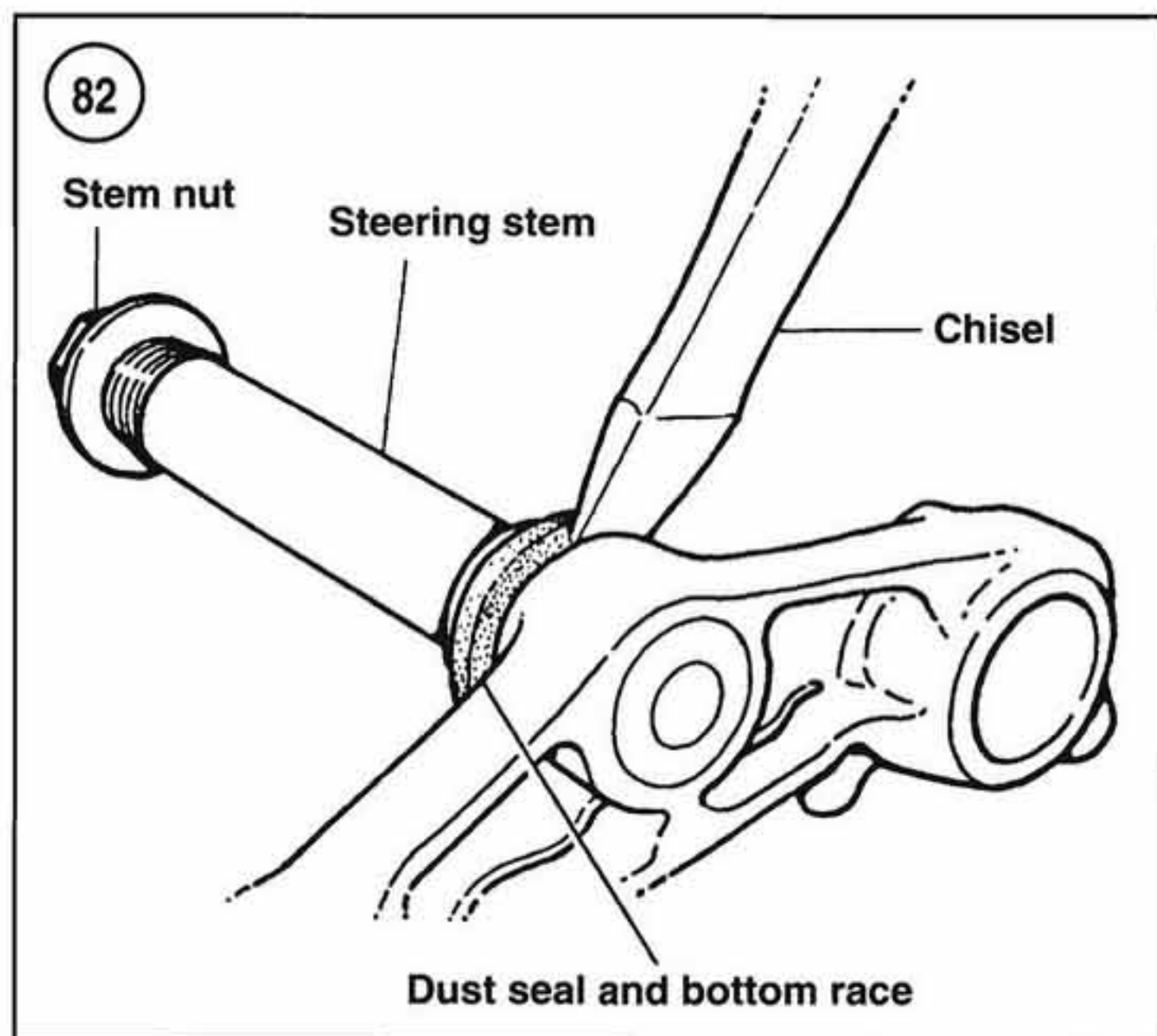
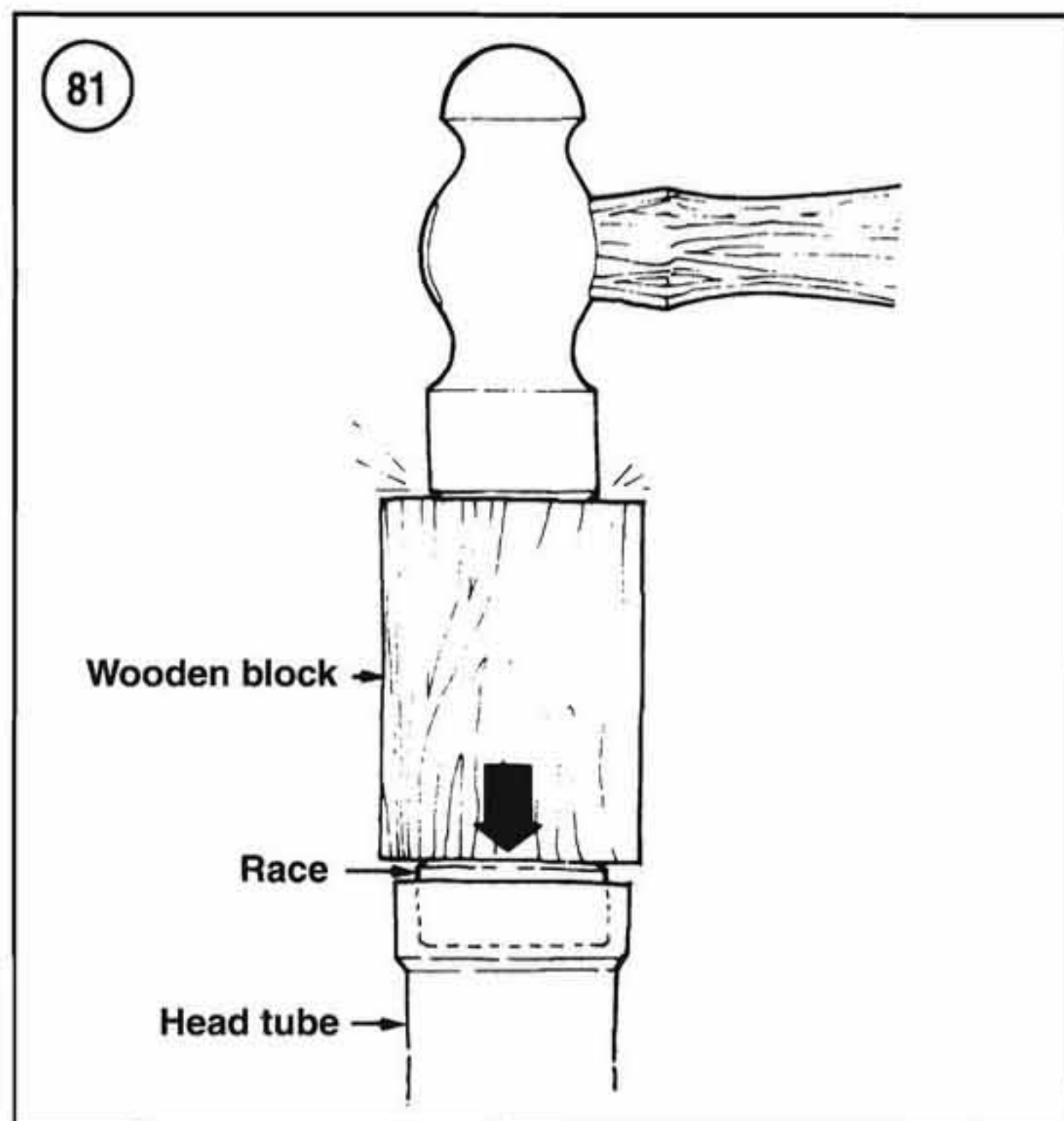
6. Replace the lower steering stem bearing (**Figure 79**) and the dust shield as described in this chapter.

7. Check for broken welds on the frame around the steering head. If any are found, have them repaired by a competent frame shop or welding service familiar with motorcycle frame repair.



#### STEERING HEAD BEARING RACE REPLACEMENT

The upper and lower bearing outer races are pressed into the frame. Do not remove the bearing races unless re-



placement is necessary. If they are removed, replace both the outer race and bearing at the same time. Never reinstall an outer race that has been removed as it is no longer true and will damage the bearing.

1. Remove the steering stem as described in this chapter.
2. To remove a race, insert an aluminum or brass rod into the steering head and carefully tap the race out from the inside (**Figure 80**). Tap all around the race so neither the race nor the steering head is bent.
3. Clean the steering head with solvent and dry it thoroughly.

4A. Install the bearing races with the steering head bearing race installer tool (JIMS part No. 1725) following the manufacturer's instructions.

4B. If the special tools are not available, install the bearing races as follows:

- a. Clean the race thoroughly before installing it.
- b. Align the upper race with the frame steering head and tap it slowly and squarely in place (**Figure 81**). Do not contact the bearing race surfaces. Drive the race into the steering head until it bottoms on the bore shoulder.
- c. Repeat substeps a-c to install the lower race into the steering head.

5. Apply bearing grease to the face of each race.

### Steering Stem Lower Bearing Replacement

Do not remove the steering stem lower bearing and lower dust seal unless they are going to be replaced. The lower bearing can be difficult to remove. If the lower bearing cannot be removed as described in this procedure, refer the service to a Harley-Davidson dealership.

Never reinstall a lower bearing that has been removed. It is no longer true and will damage the bearing assembly.

1. Install the steering stem bolt or nut onto the top of the steering stem to protect the threads.
2. Loosen the lower bearing from the shoulder at the base of the steering stem with a chisel as shown in **Figure 82**. Slide the lower bearing and lower dust seal off the steering stem.
3. Clean the steering stem with solvent and dry it thoroughly.
4. Position the new lower dust seal with the flange side facing up.
5. Slide a *new* lower dust seal and the lower bearing onto the steering stem until the bearing stops on the raised shoulder.
6. Align the lower bearing with the machined shoulder on the steering stem. Press or drive the lower bearing onto the steering stem until it bottoms (**Figure 83**).

### STEERING PLAY ADJUSTMENT

If aftermarket accessories have been installed on the steering assembly, they must be removed before attempting to adjust the steering play.

### FXR and FX Series Models

1. Use a floor jack centered under the frame. Support the motorcycle with both the front and rear wheels the same

- distance off the ground. If necessary, place a wooden block(s) under the rear wheel until the motorcycle is level.
2. On models so equipped, remove the windshield as described in Chapter Fifteen.
  3. If any control cable is routed so that it pulls the front end one way or the other, disconnect it.
  4. Loosen the lower bracket pinch bolts.
  5. Place a piece of masking tape transversely across the leading edge of the front fender.
  6. Swing the handlebar so that the front wheel faces straight ahead.
  7. Place a pointer on a stand so that the tip points to the center of the fender when the wheel is facing straight ahead.
  8. Lightly push the fender toward the right side until the front end starts to turn by itself. Mark this point on the piece of tape.
  9. Repeat Step 8 for the left side.
  10. Measure the distance between the two marks on the tape. For proper bearing adjustment, the distance should be 1-2 in. (25.4-50.8 mm). If the distance is incorrect, perform Step 11.

#### NOTE

*On FXWG models, adjustment is made by loosening or tightening the fork stem nut or bolt.*

#### NOTE

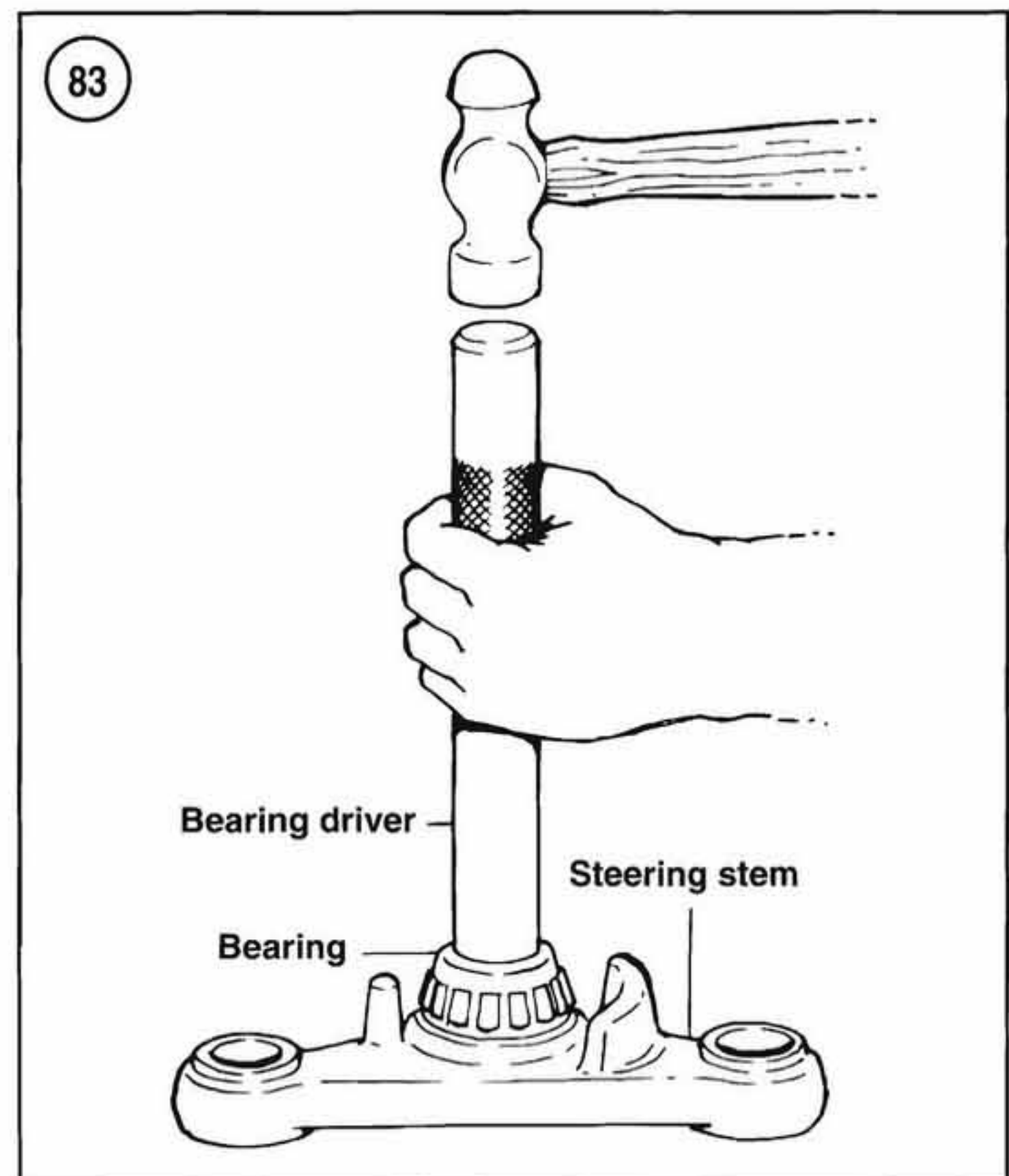
*If the adjustment is less than 1 in. (25.4 mm), slightly tighten the nut, bolt or bearing seat. Loosen the nut, bolt or bearing seat if the adjustment is more than 2 in. (50.8 mm).*

11A. On 1984-1987 FXR (except 1987 FXLR, FXRS-SP, FXEF and FXSB) models, refer to **Figure 72** and perform the following:

- a. Loosen the upper fork bracket pinch bolt and the lower bracket fork tube pinch bolts.
- b. Loosen or tighten the fork stem nut until the fall-away distance is 1-2 in. (25.4-50.8 mm).
- c. Recheck adjustment. Then, when correct, tighten the pinch bolts to 21-27 ft.-lb. (28-37 N•m).

11B. On 1987 FXLR and FXRS-SP and all 1988-1998 FXR models, refer to **Figure 73** and perform the following:

- a. Loosen the upper fork bracket pinch bolt and the lower bracket fork tube pinch bolts.
- b. Loosen or tighten the fork stem bolt until the fall-away distance is 1-2 in. (25.4-50.8 mm).
- c. Recheck adjustment. Then, when correct, tighten the pinch bolts to 25-30 ft.-lb. (34-41 N•m).



11C. On FXWG, FXSB and FXEF models, refer to **Figure 74** and **Figure 75** and perform the following:

- a. Loosen the lower bracket fork tube pinch bolts.
- b. Turn the bearing seat located underneath the upper fork bracket until the fall-away distance is 1-2 in. (25.4-50.8 mm).
- c. Recheck adjustment. Then, when correct, tighten the pinch bolts to 25-30 ft.-lb. (34-41 N•m).

12. On models so equipped, install the windshield as described in Chapter Fifteen.

#### FLH and FLT Series Models

1. Use a floor jack centered under the frame. Support the motorcycle with both the front and rear wheels the same distance off the ground. If necessary, place a wooden block(s) under the rear wheel until the motorcycle is level.
2. Remove the windshield (if so equipped) and all other accessory weight from the handlebar and front forks that could affect this adjustment.
3. If any control cable is routed so that it pulls the front end one way or the other, disconnect it.
4. Turn the wheel to the left as far as it will go and then let it go. If the steering adjustment is correct, the front wheel will swing from left to right three times and then stop near the center or straight-ahead position. If the adjustment is

incorrect (the number of swings past center is fewer or more than three times), perform the following.

5. Loosen the lower bracket pinch bolts.
6. Slide both rubber fork stops a few inches up the respective fork tubes.
7. Straighten the lockwasher tab away from the fork stem nut and loosen the nut.
8. Insert a drift punch into a notch in the bearing adjust nut (**Figure 74**). Tighten the nut to decrease the number of swings or loosen the nut to increase the number of swings.

9. Tighten the lower bracket pinch bolts to the specification in **Table 5**.

10. Tighten the fork stem nut to the specification in **Table 5**. Bend the lockwasher tab against one flat on the nut; tighten the nut, if required, to align the nut flat and lockwasher tab.

11. Recheck the bearing adjustment.

12. When the adjustment is correct, reposition the rubber fork stops.

13. Reinstall all parts previously removed.

**Table 1 FRONT FORK OIL CAPACITY**

| Model and year                          | Oil Change |       | Rebuild |       |
|-----------------------------------------|------------|-------|---------|-------|
|                                         | oz.        | cc    | oz.     | cc    |
| <b>FXR</b>                              |            |       |         |       |
| 1984-1987 FXR and FXRS                  | 6.25       | 184.8 | 7.0     | 206.9 |
| 1984-1987 FXRD and FXRT                 | 7.0        | 206.9 | 7.75    | 229.2 |
| 1987-1994 FXLR                          | 9.2        | 272   | 10.2    | 300.9 |
| 1988-1994 FXR and FXRS                  | 9.2        | 272   | 10.2    | 300.9 |
| 1988-1994 FXRT and FXRS-SP and FXRS-Con | 10.5       | 310.5 | 11.5    | 339.2 |
| 1999 FXR2 and FXR3                      | 9.2        | 272   | 10.2    | 300.9 |
| <b>FXWG</b>                             | 10.2       | 300.9 | 11.2    | 330.4 |
| <b>FXSB</b>                             | 7.5        | 221.8 | 6.75    | 199.6 |
| <b>FXEF</b>                             | 5.0        | 147.8 | 6.5     | 192.2 |
| <b>FLT and FLH series models</b>        | 7.75       | 229.2 | 8.5     | 251.3 |

**Table 2 FRONT FORK AIR CONTROL (1984-1994 FXR SERIES MODELS)**

| Vehicle load                                    | Recommended air pressure psi (kPa) |                                        |
|-------------------------------------------------|------------------------------------|----------------------------------------|
|                                                 | Front fork                         | Accumulator 1984-1987<br>FXRD and FXRT |
| Rider weight not exceeding 150 lbs. (68 kg)     | 4-8 (28-55)                        | 5-30 (34-207)                          |
| Each additional 25 lbs. (11 kg), add            | 2 (14)                             |                                        |
| Passenger weight: For each 50 lbs. (23 kg), add | 1 (7)                              |                                        |
| Maximum pressure                                | 20 (138)                           | 30 (207)                               |

**Table 3 FRONT FORK AIR CONTROL (1984-1994 FLH AND FLT SERIES MODELS)**

| Ride   | Amount of antidive | Recommended pressure psi (kPa) |
|--------|--------------------|--------------------------------|
| Firm   | Stiff              | 20 (138)                       |
| Normal | Normal             | 15 (103)                       |
| Soft   | Soft               | 10 (69)                        |

**Table 4 AIR SUSPENSION ADJUSTMENTS (1995-1998 FLH AND FLT SERIES MODELS)**

| Load                                                       | Recommended pressure psi (kPa) |                     |
|------------------------------------------------------------|--------------------------------|---------------------|
|                                                            | Front fork                     | Rear shock absorber |
| Rider weight                                               |                                |                     |
| Up to 150 lbs. (68 kg), add                                | —                              | —                   |
| For each additional 25 lbs. (11 kg), add                   | 1 (7)                          | 1 (7)               |
| Passenger weight: For each additional 50 lbs. (23 kg), add | —                              | 1.5 (10)            |
| Luggage weight: For each additional 10 lbs. (4.5 kg), add  | 1 (7)                          | 3 (21)              |
| Maximum pressure                                           | 25 (172)                       | 35 (241)            |

**Table 5 FRONT SUSPENSION TORQUE SPECIFICATIONS**

| Item                                       | ft.-lb.  | in.-lb. | N•m   |
|--------------------------------------------|----------|---------|-------|
| Fork air control system                    |          |         |       |
| Air tubes banjo bolts                      |          |         |       |
| 1984-1994 FXRD, FXRT and FXRS-SP models    | 25-30    | —       | 34-41 |
| Air accumulator bracket bolts              |          |         |       |
| 1984-1987 FXRD and FXRT models             | 30-35    | —       | 41-47 |
| Antidive solenoid housing bolts            |          |         |       |
| 1984-1987 FXRD and FXRT models             | —        | 155-190 | 17-21 |
| Air tubes flange nuts                      |          |         |       |
| 1988-1994 FXRT and FXRS-SP                 | 17       | —       | 23    |
| Antidive switch bolts                      |          |         |       |
| 1986-1996 FLH and FLT series models        | 25-30    | —       | 34-41 |
| 1986-1996 FLHT and FLHTC models            | 25-30    | —       | 34-41 |
| Air tube assembly hex bolts                |          |         |       |
| 1997-1998 FLH and FLT series models        | —        | 97-142  | 11-16 |
| Antidive solenoid banjo bolts              | —        | 97-124  | 11-14 |
| Fork tube pinch bolts                      |          |         |       |
| FXR series models                          |          |         |       |
| 1984-1987 FXR, FXRS, FXRD and FXRT         |          |         |       |
| Upper                                      | 21-27    | —       | 28-37 |
| Lower                                      | 30-35    | —       | 41-47 |
| 1987 FXLR, FXRS and 1988-1992 FXR          |          |         |       |
| Upper and lower                            | 25-30    | —       | 34-41 |
| 1993-1994 FXR, 1999 FXR2 and FXR3          |          |         |       |
| Upper and lower                            | 30-35    | —       | 41-47 |
| FXWG, FXSB and FXEF                        | 25-30    | —       | 34-41 |
| FLH and FLT series models                  |          |         |       |
| 1984-1990                                  | 25       | —       | 34    |
| 1991-1998                                  | 40       | —       | 54    |
| Fork tube plug (FLH and FLT series models) | 50-55    | —       | 68-75 |
| Fork stem and bracket                      |          |         |       |
| FXR series models                          |          |         |       |
| Fork stem nut or bolt                      | See text |         |       |
| Upper bracket-to-fork stem pinch bolt      |          |         |       |
| 1984-1987 FXR, FXRS, FXRD and FXRT         | 21-27    | —       | 28-37 |
| 1987 FXLR, FXRS and 1988-1992 FXR          | 25-30    | —       | 34-41 |
| 1993-1994 FXR                              | 30-35    | —       | 41-47 |
| FXWG, FXR2 and FXR3                        |          |         |       |
| Fork stem nut                              | 35-40    | —       | 47-54 |
| Brake hose-to-lower steering stem bracket  | —        | 133     | 15    |
| FXSB and FXEF                              |          |         |       |
| Fork stem nut                              | See text |         |       |
| Upper bracket-to-fork stem pinch bolt      | 20-25    | —       | 27-34 |
| FLH and FLT series models                  |          |         |       |
| Fork stem nut                              | 35-40    | —       | 47-54 |
| Steering stem nut                          |          |         |       |
| FLH and FLT                                | 35-40    | —       | 41-54 |